

FILE 'HOME' ENTERED AT 17:23:06 ON 13 DEC 2006

=> f reg

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=> file reg

COST IN U.S. DOLLARS

SINCE FILE

TOTAL

ENTRY

SESSION

FULL ESTIMATED COST

0.21

0.21

FILE 'REGISTRY' ENTERED AT 17:23:15 ON 13 DEC 2006

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STRUCTURE FILE UPDATES: 12 DEC 2006 HIGHEST RN 915277-53-1

DICTIONARY FILE UPDATES: 12 DEC 2006 HIGHEST RN 915277-53-1

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<http://www.cas.org/ONLINE/UG/regprops.html>

=> s (1.01-4)/Li and (0.01-0.99)/Mn and (0.01-0.99)/Cr and (1.8-2.5)/O

18959 (1.01-4)/LI

27138 (0.01-0.99)/MN

11986 (0.01-0.99)/CR

5907621 (1.8-2.5)/O

L1 38 (1.01-4)/LI AND (0.01-0.99)/MN AND (0.01-0.99)/CR AND (1.8-2.5)/

O

=> file caplus

COST IN U.S. DOLLARS

SINCE FILE

TOTAL

ENTRY

SESSION

FULL ESTIMATED COST

19.92

20.13

FILE 'CAPLUS' ENTERED AT 17:24:22 ON 13 DEC 2006

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FILE COVERS 1907 - 13 Dec 2006 VOL 145 ISS 25  
FILE LAST UPDATED: 12 Dec 2006 (20061212/ED)

Effective October 17, 2005, revised CAS Information Use Policies apply. They are available for your review at:

<http://www.cas.org/infopolicy.html>

=> s l1 and battery  
30 L1  
129572 BATTERY  
L2 29 L1 AND BATTERY

=> d l2 1-29 ibib kwic

L2 ANSWER 1 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2006:866161 CAPLUS  
DOCUMENT NUMBER: 145:422490  
TITLE: Structural and electrochemical properties of  
Li[Cr<sub>0.29</sub>Li<sub>0.24</sub>Mn<sub>0.47</sub>]O<sub>2</sub> nanocomposite electrode for  
lithium-ion batteries  
AUTHOR(S): Park, Chan-Woo; Kim, Jaekook  
CORPORATE SOURCE: Department of Materials Science and Engineering,  
Chonnam National University, Gwangju, 500-757, S.  
Korea  
SOURCE: Chemistry Letters (2006), 35(8), 886-887  
CODEN: CMLTAG; ISSN: 0366-7022  
PUBLISHER: Chemical Society of Japan  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT  
ST chromium lithium manganese oxide nanocomposite cathode lithium ion  
battery  
IT Battery cathodes  
Nanocomposites  
(structural and electrochem. properties of Li[Cr<sub>0.29</sub>Li<sub>0.24</sub>Mn<sub>0.47</sub>]O<sub>2</sub>  
nanocomposite electrode for lithium-ion batteries)  
IT 912551-97-4, Chromium lithium manganese oxide  
(Cr<sub>0.29</sub>Li<sub>1.24</sub>Mn<sub>0.47</sub>O<sub>2</sub>)  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(structural and electrochem. properties of Li[Cr<sub>0.29</sub>Li<sub>0.24</sub>Mn<sub>0.47</sub>]O<sub>2</sub>  
nanocomposite electrode for lithium-ion batteries)

L2 ANSWER 2 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2006:402355 CAPLUS  
DOCUMENT NUMBER: 144:415971  
TITLE: Method of preparation of conductive agent-cathode  
active material composite for lithium secondary  
battery  
INVENTOR(S): Cheon, Sang-Eun; Yoo, Seok-Yoon; Yoon, Hye-Won; Kim,  
Jae-Kyung  
PATENT ASSIGNEE(S): Samsung Sdi Co., Ltd., S. Korea  
SOURCE: Eur. Pat. Appl., 27 pp.  
CODEN: EPXXDW  
DOCUMENT TYPE: Patent  
LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1653534	A1	20060503	EP 2005-110064	20051027
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, BA, HR, IS, YU				
KR 2006037618	A	20060503	KR 2004-86630	20041028
US 2006093920	A1	20060504	US 2005-258731	20051025
CN 1770516	A	20060510	CN 2005-10116672	20051026
JP 2006128119	A2	20060518	JP 2005-314501	20051028
PRIORITY APPLN. INFO.:			KR 2004-86630	A 20041028
REFERENCE COUNT:		16	THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT	

TI Method of preparation of conductive agent-cathode active material composite for lithium secondary battery

AB The invention relates to a conductive agent/pos. active material composite for a lithium secondary battery. The composite includes a pos. active material capable of reversibly intercalating/deintercalating lithium ions, and a conductive agent on the surface of the pos. active material. The conductive agent comprises a first conductive agent having a sp. surface area ranging from about 200 to about 1500 m<sup>2</sup>/g and a second conductive agent having a sp. surface area of about 100 m<sup>2</sup>/g or less.

ST lithium secondary battery cathode conductive agent composite

IT Secondary batteries  
(lithium; method of preparation of conductive agent-cathode active material composite for lithium secondary battery)

IT Battery cathodes  
Electric conductors  
(method of preparation of conductive agent-cathode active material composite for lithium secondary battery)

IT Carbon black, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(method of preparation of conductive agent-cathode active material composite for lithium secondary battery)

IT 1314-62-1, Vanadium oxide (V<sub>2</sub>O<sub>5</sub>), uses 1317-33-5, Molybdenum sulfide (MoS<sub>2</sub>), uses 12017-96-8, Chromium lithium oxide (CrLiO<sub>2</sub>) 12022-46-7, Iron lithium oxide (FeLiO<sub>2</sub>) 12031-65-1, Lithium nickel oxide (LiNiO<sub>2</sub>) 12039-13-3, Titanium sulfide (TiS<sub>2</sub>) 12057-17-9, Lithium manganese oxide (LiMn<sub>2</sub>O<sub>4</sub>) 12162-79-7, Lithium manganese oxide limno<sub>2</sub> 12162-87-7, Lithium vanadium oxide livo<sub>2</sub> 12162-92-4, Lithium vanadium oxide (LiV<sub>2</sub>O<sub>5</sub>) 12169-03-8, Lithium yttrium oxide (LiYO<sub>2</sub>) 12190-79-3, Cobalt lithium oxide (CoLiO<sub>2</sub>) 12201-18-2, Lithium molybdenum sulfide (LiMoS<sub>2</sub>) 12209-15-3, Lithium scandium oxide lisco<sub>2</sub> 13568-36-0, Lithium nickel vanadium oxide (LiNiVO<sub>4</sub>) 55326-82-4, Lithium titanium sulfide litis<sub>2</sub> 218446-64-1, Aluminum cobalt lithium nickel oxide (Al<sub>0.04</sub>Co<sub>0.15</sub>LiNi<sub>0.81</sub>O<sub>2</sub>) 329025-35-6, Iron lithium phosphate (Fe<sub>2</sub>Li<sub>1-3</sub>(PO<sub>4</sub>)<sub>3</sub>) 884323-27-7, Iron lithium phosphate (Fe<sub>2</sub>Li<sub>0-3</sub>(PO<sub>4</sub>)<sub>3</sub>) 884323-28-8, Lithium vanadium phosphate (Li<sub>0-3</sub>V<sub>2</sub>(PO<sub>4</sub>)<sub>3</sub>) 884323-29-9, Chromium lithium phosphate (Cr<sub>2</sub>Li<sub>0-3</sub>(PO<sub>4</sub>)<sub>3</sub>) 884323-30-2, Lithium manganese phosphate (Li<sub>0-3</sub>Mn<sub>2</sub>(PO<sub>4</sub>)<sub>3</sub>) 884323-31-3, Cobalt lithium phosphate (Co<sub>2</sub>Li<sub>0-3</sub>(PO<sub>4</sub>)<sub>3</sub>) 884323-32-4, Copper lithium phosphate (Cu<sub>2</sub>Li<sub>0-3</sub>(PO<sub>4</sub>)<sub>3</sub>) 884323-33-5, Aluminum cobalt lithium nickel oxide (Al<sub>0-0.1</sub>Co<sub>0-0.5</sub>Li<sub>0.9-1.1</sub>Ni<sub>0-0.9</sub>O<sub>2</sub>) 884323-35-7, Chromium cobalt lithium nickel oxide (Cr<sub>0-0.1</sub>Co<sub>0-0.5</sub>Li<sub>0.9-1.1</sub>Ni<sub>0-0.9</sub>O<sub>2</sub>) 884323-37-9, Cobalt lithium manganese nickel oxide (Co<sub>0-0.5</sub>Li<sub>0.9-1.1</sub>Mn<sub>0-0.1</sub>Ni<sub>0-0.9</sub>O<sub>2</sub>) 884323-39-1, Cobalt iron lithium nickel oxide (Co<sub>0-0.5</sub>Fe<sub>0-0.1</sub>Li<sub>0.9-1.1</sub>Ni<sub>0-0.9</sub>O<sub>2</sub>) 884323-41-5, Cobalt lithium magnesium nickel oxide (Co<sub>0-0.5</sub>Li<sub>0.9-1.1</sub>Mg<sub>0-0.1</sub>Ni<sub>0-0.9</sub>O<sub>2</sub>) 884323-45-9, Cobalt lanthanum lithium nickel oxide (Co<sub>0-0.5</sub>La<sub>0-0.1</sub>Li<sub>0.9-1.1</sub>Ni<sub>0-0.9</sub>O<sub>2</sub>) 884323-47-1, Cerium cobalt lithium nickel oxide (Ce<sub>0-0.1</sub>Co<sub>0-0.5</sub>Li<sub>0.9-1.1</sub>Ni<sub>0-0.9</sub>O<sub>2</sub>) 884323-48-2, Cobalt lithium nickel

strontium oxide (Co0-0.5Li0.9-1.1Ni0-0.9Sr0-0.1O2) 884323-49-3, Cobalt  
 lithium nickel vanadium oxide (Co0-0.5Li0.9-1.1Ni0-0.9V0-0.1O2)  
 884323-50-6, Lithium manganese nickel vanadium oxide (Li0.9-1.1Mn0-0.5Ni0-  
 0.9V0-0.1O2) 884323-51-7, Lithium manganese nickel strontium oxide  
 (Li0.9-1.1Mn0-0.5Ni0-0.9Sr0-0.1O2) 884323-52-8, Cerium lithium manganese  
 nickel oxide (Ce0-0.1Li0.9-1.1Mn0-0.5Ni0-0.9O2) 884323-53-9, Lanthanum  
 lithium manganese nickel oxide (La0-0.1Li0.9-1.1Mn0-0.5Ni0-0.9O2)  
 884323-54-0, Lithium magnesium manganese nickel oxide (Li0.9-1.1Mg0-0.1Mn0-  
 0.5Ni0-0.9O2) 884323-55-1, Iron lithium manganese nickel oxide  
 (Fe0-0.1Li0.9-1.1Mn0-0.5Ni0-0.9O2) 884323-56-2, Lithium manganese nickel  
 oxide (Li0.9-1.1Mn0-0.6Ni0-0.9O2) 884323-58-4, Chromium lithium  
 manganese nickel oxide (Cr0-0.1Li0.9-1.1Mn0-0.5Ni0-0.9O2) 884323-59-5,  
 Aluminum lithium manganese nickel oxide (Al0-0.1Li0.9-1.1Mn0-0.5Ni0-0.9O2)  
 884323-62-0 884323-64-2 884323-66-4, Cobalt lithium manganese  
 nickel oxide (Co0-0.5Li0.9-1.1Mn0-0.6Ni0-0.9O2) 884323-69-7  
 884323-71-1 884323-73-3 884323-74-4 884323-75-5 884323-76-6  
 884323-77-7, Aluminum lithium nickel oxide (Al0-0.1Li0.9-1.1NiO2)  
 884323-78-8, Chromium lithium nickel oxide (Cr0-0.1Li0.9-1.1NiO2)  
 884323-79-9, Lithium manganese nickel oxide (Li0.9-1.1Mn0-0.1NiO2)  
 884323-80-2, Iron lithium nickel oxide (Fe0-0.1Li0.9-1.1NiO2)  
 884323-81-3, Lithium magnesium nickel oxide (Li0.9-1.1Mg0-0.1NiO2)  
 884323-82-4, Lanthanum lithium nickel oxide (La0-0.1Li0.9-1.1NiO2)  
 884323-83-5, Cerium lithium nickel oxide (Ce0-0.1Li0.9-1.1NiO2)  
 884323-84-6, Lithium nickel strontium oxide (Li0.9-1.1NiSr0-0.1O2)  
 884323-85-7, Lithium nickel vanadium oxide (Li0.9-1.1NiV0-0.1O2)  
 884323-86-8, Aluminum cobalt lithium oxide (Al0-0.1CoLi0.9-1.1O2)  
 884323-87-9, Chromium cobalt lithium oxide (Cr0-0.1CoLi0.9-1.1O2)  
 884323-88-0, Cobalt lithium manganese oxide (CoLi0.9-1.1Mn0-0.1O2)  
 884323-89-1, Cobalt iron lithium oxide (CoFe0-0.1Li0.9-1.1O2)  
 884323-90-4, Cobalt lithium magnesium oxide (CoLi0.9-1.1Mg0-0.1O2)  
 884323-91-5, Cobalt lanthanum lithium oxide (CoLa0-0.1Li0.9-1.1O2)  
 884323-92-6, Cerium cobalt lithium oxide (Ce0-0.1CoLi0.9-1.1O2)  
 884323-93-7, Cobalt lithium strontium oxide (CoLi0.9-1.1Sr0-0.1O2)  
 884323-94-8, Cobalt lithium vanadium oxide (CoLi0.9-1.1V0-0.1O2)  
 884323-95-9, Aluminum lithium manganese oxide (Al0-0.1Li0.9-1.1MnO2)  
 884323-96-0, Chromium lithium manganese oxide (Cr0-0.1Li0.9-1.1MnO2)  
 884323-97-1, Lithium manganese oxide (Li0.9-1.1Mn1-1.1O2) 884324-00-9,  
 Iron lithium manganese oxide (Fe0-0.1Li0.9-1.1MnO2) 884324-02-1, Lithium  
 magnesium manganese oxide (Li0.9-1.1Mg0-0.1MnO2) 884324-05-4, Lanthanum  
 lithium manganese oxide (La0-0.1Li0.9-1.1MnO2) 884324-08-7, Cerium  
 lithium manganese oxide (Ce0-0.1Li0.9-1.1MnO2) 884324-11-2, Lithium  
 manganese strontium oxide (Li0.9-1.1MnSr0-0.1O2) 884324-16-7, Lithium  
 manganese vanadium oxide (Li0.9-1.1MnV0-0.1O2) 884324-19-0, Aluminum  
 lithium manganese oxide (Al0-0.1Li0.9-1.1Mn2O4) 884324-21-4, Chromium  
 lithium manganese oxide (Cr0-0.1Li0.9-1.1Mn2O4) 884324-23-6, Iron  
 lithium manganese oxide (Fe0-0.1Li0.9-1.1Mn2O4) 884324-26-9, Lithium  
 magnesium manganese oxide (Li0.9-1.1Mg0-0.1Mn2O4) 884324-28-1, Lanthanum  
 lithium manganese oxide (La0-0.1Li0.9-1.1Mn2O4) 884324-30-5, Cerium  
 lithium manganese oxide (Ce0-0.1Li0.9-1.1Mn2O4) 884324-31-6, Lithium  
 manganese strontium oxide (Li0.9-1.1Mn2Sr0-0.1O4) 884324-32-7, Lithium  
 manganese vanadium oxide (Li0.9-1.1Mn2V0-0.1O4)  
 RL: DEV (Device component use); USES (Uses)  
 (method of preparation of conductive agent-cathode active material composite  
 for lithium secondary battery)

L2 ANSWER 3 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2006:43560 CAPLUS

DOCUMENT NUMBER: 145:359884

TITLE: Layered lithium chromium manganese oxide compounds for  
high capacity electrode materials in rechargeable  
lithium batteries

AUTHOR(S): Mangani, I. Ruth; Parks, C. W.; Kim, S. H.; Kim, J.

CORPORATE SOURCE: Department of Materials Science and Engineering,

Chonnam National University, Gwangju, 500-757, S.  
Korea  
SOURCE: Ionics (2005), 11(5 & 6), 366-369  
CODEN: IONIFA; ISSN: 0947-7047  
PUBLISHER: Institute for Ionics  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST layered lithium chromium manganese oxide cathode rechargeable  
battery  
IT Battery cathodes  
(layered lithium chromium manganese oxide high-capacity cathode  
materials for lithium batteries)  
IT 693252-41-4, Chromium lithium manganese oxide  
(Cr<sub>0.2</sub>Li<sub>1.27</sub>Mn<sub>0.53</sub>O<sub>2</sub>)  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(layered lithium chromium manganese oxide high-capacity cathode  
materials for lithium batteries)  
IT 497260-94-3, Chromium lithium manganese oxide  
(Cr<sub>0.25</sub>Li<sub>1.25</sub>Mn<sub>0.50</sub>O<sub>2</sub>) 749913-31-3, Chromium lithium manganese  
oxide (Cr<sub>0.15</sub>Li<sub>1.28</sub>Mn<sub>0.57</sub>O<sub>2</sub>) 910228-48-7, Cobalt lithium manganese oxide  
(Co<sub>0.3</sub>Li<sub>1.23</sub>Mn<sub>0.46</sub>O<sub>2</sub>)  
RL: PRP (Properties); TEM (Technical or engineered material use); USES  
(Uses)  
(layered lithium chromium manganese oxide high-capacity cathode  
materials for lithium batteries)

L2 ANSWER 4 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2005:810577 CAPLUS  
DOCUMENT NUMBER: 144:314979  
TITLE: Preparation and electrochemical properties of  
Li<sub>1.2</sub>Cr<sub>0.4</sub>Mn<sub>0.402</sub> as cathode  
AUTHOR(S): Zhao, Yong; Wan, Min; Wu, Zhi-yuan  
CORPORATE SOURCE: College of Chemistry and Molecular Sciences, Wuhan  
University, Wuhan, Hubei, 430072, Peop. Rep. China  
SOURCE: Wuhan Daxue Xuebao, Lixueban (2005), 51(2), 157-160  
CODEN: WDXLA5; ISSN: 1671-8836  
PUBLISHER: Wuhan Daxue Qikanshe  
DOCUMENT TYPE: Journal  
LANGUAGE: Chinese

AB Layered Li<sub>1.2</sub>Cr<sub>0.4</sub>Mn<sub>0.402</sub> was prepared by sol-gel method for use as  
battery cathode. The effects of different calcination temps. on  
structure and electrochem. properties were studied. Crystalline structure,  
changes of valence during charge and discharge, particle morphol., and  
crystalline size were investigated by x-ray diffraction, XPS, and SEM.  
Li<sub>1.2</sub>Cr<sub>0.4</sub>Mn<sub>0.402</sub> treated at 850° exhibited excellent layered  
structure and electrochem. properties. Chromium oxidation state is changing  
reversibly between +6 and +3 during charge and discharge, while manganese  
oxidation state remains +4. The cathode exhibits an initial discharge  
capacity of 280 mA-h/g at a low current rate (10 mA/g), with remaining  
capacity of 190 mA-h/g after 40th cycle.  
ST chromium lithium manganese oxide prepn; cathode chromium lithium manganese  
oxide battery  
IT Battery cathodes  
(preparation and electrochem. properties of chromium lithium manganese oxide  
used as cathode material for batteries)  
IT 410538-69-1, Chromium lithium manganese oxide (Cr<sub>0.4</sub>Li<sub>1.2</sub>Mn<sub>0.402</sub>)  
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical,  
engineering or chemical process); TEM (Technical or engineered material  
use); PROC (Process); USES (Uses)  
(preparation and electrochem. properties of chromium lithium manganese oxide  
used as cathode material for batteries)

L2 ANSWER 5 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:798329 CAPLUS

DOCUMENT NUMBER: 144:334120

TITLE: Preparation and performance of  $\text{Li}_{1.2}\text{Cr}_{0.4}\text{Mn}_{0.4}\text{O}_2$  as cathode material

AUTHOR(S): Zhao, Yong; Wu, Zhi-yuan

CORPORATE SOURCE: College of Chemistry and Molecular Sciences, Wuhan University, Wuhan, Hubei, 430072, Peop. Rep. China

SOURCE: Dianchi (2005), 35(3), 173-175

CODEN: DNCHEP; ISSN: 1001-1579

PUBLISHER: Dianchi Zazhishe

DOCUMENT TYPE: Journal

LANGUAGE: Chinese

ST lithium chromium manganese oxide cathode battery sol gel method

IT Battery cathodes

Electrochemistry

Sol-gel processing

(preparation by sol-gel method and performance of lithium chromium manganese oxide as cathode material)

IT 410538-69-1P, Chromium lithium manganese oxide ( $\text{Cr}_{0.4}\text{Li}_{1.2}\text{Mn}_{0.4}\text{O}_2$ )

RL: DEV (Device component use); PRP (Properties); SPN (Synthetic

preparation); PREP (Preparation); USES (Uses)

(preparation by sol-gel method and performance of lithium chromium manganese oxide as cathode material)

L2 ANSWER 6 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:283977 CAPLUS

DOCUMENT NUMBER: 142:339119

TITLE: Method of preparation of cathode composition for lithium batteries

INVENTOR(S): Wu, Xianglan; Park, Yong Joon; Ryu, Kwang Sun; Chang, Soon Ho

PATENT ASSIGNEE(S): S. Korea

SOURCE: U.S. Pat. Appl. Publ., 9 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2005069772	A1	20050331	US 2004-886077	20040706
KR 2005030459	A	20050330	KR 2003-66949	20030926
JP 2005108818	A2	20050421	JP 2004-237632	20040817
PRIORITY APPLN. INFO.:			KR 2003-66949	A 20030926

AB Provided is a cathode composition for lithium secondary battery that includes a lithium-chromium-titanium-manganese oxide that has the formula  $\text{Li}[\text{Li}(1-x)/3\text{Cr}_x\text{Ti}_2/3\text{yMn}_2(1-x-y)/3]\text{O}_2$ , where  $0 \leq x \leq 0.3$ ,  $0 \leq y \leq 0.3$  and  $0.1 \leq x+y \leq 0.3$ , and layered  $\alpha\text{-LiFeO}_2$  structure. A method of synthesizing the lithium-chromium-titanium manganese oxide includes preparing a first mixed solution by dispersing titanium dioxide in a mixed solution of chrome acetate ( $\text{Cr}_3(\text{OH})_2(\text{CH}_3\text{CO}_2)_7$ ) and manganese acetate ( $(\text{CH}_3\text{CO}_2)_2\text{Mn} \cdot 4\text{H}_2\text{O}$ ), adding a lithium hydroxide solution to the first mixed solution to obtain homogeneous ppts., forming precursor powder that has the formula  $\text{Li}[\text{Li}(1-x)/3\text{Cr}_x\text{Ti}_2/3\text{yMn}_2(1-x-y)/3]\text{O}_2$  where  $0 \leq x \leq 0.3$ ,  $0 \leq y \leq 0.3$  and  $0.1 \leq x+y \leq 0.3$  by heating the homogeneous ppts., and heating the precursor powder to form oxide powder having a layered structure.

ST cathode compn prepn lithium battery

IT Battery cathodes

(method of preparation of cathode composition for lithium batteries)  
 IT 848771-81-3P 848771-82-4P 848771-83-5P  
 848771-84-6P 848771-86-8P  
 RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
 (Preparation); USES (Uses)  
 (method of preparation of cathode composition for lithium batteries)

L2 ANSWER 7 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2005:275999 CAPLUS  
 DOCUMENT NUMBER: 142:357994  
 TITLE: Cathode for secondary lithium battery  
 INVENTOR(S): Noguchi, Takehiro; Yamazaki, Ikiko; Numata, Tatsuji  
 PATENT ASSIGNEE(S): NEC Corp., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 16 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005085720	A2	20050331	JP 2003-319552	20030911
PRIORITY APPLN. INFO.:			JP 2003-319552	20030911

TI Cathode for secondary lithium battery  
 AB The cathode contains a Li-intercalating spinel structured composite oxide:  $\text{Li}[\text{M}_1\text{mM}_2\text{-m}]\text{O}_4$  ( $\text{M}_1 = \text{Ni, Cr, Fe, Co, and/or Cu}$ ;  $\text{M}_2 = \text{Mn, Ti, and/or Si}$ ; and  $\text{m} = 0.4\text{-}1.1$ ) and a layer structured composite oxide:  $\text{Li}[\text{M}_x\text{Z}_y\text{Mn}_{1-x-y}]\text{O}_2$  ( $\text{M} = \text{Ni, Cr, Fe, Co, and/or Cu}$ ;  $\text{Z} = \text{Li, Al, and/or Mg}$ ;  $\text{x} = 0.1\text{-}0.5$ ;  $\text{y} = 0\text{-}0.3$ ; and  $\text{x+y} = 0.1\text{-}0.5$ ). The battery uses the above cathode.  
 ST secondary lithium battery cathode layer structured lithium composite oxide; battery cathode lithium manganese oxide  
 IT Battery cathodes  
 (cathodes containing mixts. of layer structured lithium manganese oxides and spinel structured lithium composite oxide for secondary lithium batteries)  
 IT 12031-75-3, Lithium manganese nickel oxide ( $\text{LiMn}_{1.5}\text{Ni}_{0.5}\text{O}_4$ ) 113066-89-0, Cobalt lithium nickel oxide ( $\text{Co}_{0.2}\text{LiNi}_{0.8}\text{O}_2$ ) 118819-08-2, Cobalt lithium manganese oxide ( $\text{Co}_{0.5}\text{LiMn}_{0.5}\text{O}_2$ ) 128975-24-6, Lithium manganese nickel oxide ( $\text{LiMn}_{0.5}\text{Ni}_{0.5}\text{O}_2$ ) 508200-28-0, Lithium manganese nickel titanium oxide ( $\text{LiMn}_{1.35}\text{Ni}_{0.5}\text{Ti}_{0.15}\text{O}_4$ ) 848828-23-9, Lithium manganese nickel oxide ( $\text{Li}_{1.1}\text{Mn}_{0.57}\text{Ni}_{0.33}\text{O}_2$ ) 848828-24-0, Chromium lithium manganese oxide ( $\text{Cr}_{0.2}\text{Li}_{1.1}\text{Mn}_{0.7}\text{O}_2$ ) 848828-25-1, Aluminum lithium manganese nickel oxide ( $\text{Al}_{0.05}\text{LiMn}_{0.5}\text{Ni}_{0.45}\text{O}_2$ ) 848828-26-2, Lithium magnesium manganese nickel oxide ( $\text{LiMg}_{0.05}\text{Mn}_{0.5}\text{Ni}_{0.45}\text{O}_2$ )  
 RL: DEV (Device component use); USES (Uses)  
 (cathodes containing mixts. of layer structured lithium manganese oxides and spinel structured lithium composite oxide for secondary lithium batteries)

L2 ANSWER 8 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2004:1128952 CAPLUS  
 DOCUMENT NUMBER: 142:59801  
 TITLE: Cathode material and secondary lithium battery  
 INVENTOR(S): Li, Guo-Hua  
 PATENT ASSIGNEE(S): Sony Corp., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 21 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004362934	A2	20041224	JP 2003-159808	20030604
PRIORITY APPLN. INFO.:			JP 2003-159808	20030604
TI	Cathode material and secondary lithium battery			
AB	The cathode material comprises a Li, Mn, Cr containing composite oxide and has a particle diameter at 90% on particle size distribution curve $\leq 10 \mu\text{m}$ and an average particle diameter $0.05\text{-}7 \mu\text{m}$ . The battery has the above cathode, an anode, and an electrolyte solution			
ST	secondary battery cathode lithium manganese chromium oxide particle control			
IT	Battery cathodes (cathodes containing lithium manganese chromium composite oxides with controlled particle size for secondary lithium batteries)			
IT	410538-69-1, Chromium lithium manganese oxide ( $\text{Cr}_{0.4}\text{Li}_{1.2}\text{Mn}_{0.4}\text{O}_2$ ) 640772-76-5 640772-77-6 640772-78-7 RL: DEV (Device component use); PRP (Properties); USES (Uses) (cathodes containing lithium manganese chromium composite oxides with controlled particle size for secondary lithium batteries)			

L2 ANSWER 9 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:764471 CAPLUS

DOCUMENT NUMBER: 141:317139

TITLE: Studies on capacity increase of  $\text{Li}_{1.27}\text{Cr}_{0.2}\text{Mn}_{0.53}\text{O}_2$ -based lithium batteries

AUTHOR(S): Wu, Xianglan; Chang, Soon Ho; Park, Yong Joon; Ryu, Kwang Sun

CORPORATE SOURCE: Basic Research Laboratory, Electronics and Telecommunications Research Institute, Yuseong-gu, Daejeon, 305-350, S. Korea

SOURCE: Journal of Power Sources (2004), 137(1), 105-110  
CODEN: JPSODZ; ISSN: 0378-7753

PUBLISHER: Elsevier B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

REFERENCE COUNT: 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

AB A  $\text{Li}/\text{Li}_{1.27}\text{Cr}_{0.2}\text{Mn}_{0.53}\text{O}_2$  battery is found to deliver an excellent discharge capacity of  $\text{apprx.}260 \text{ mA-h/g}$ , but exhibits a continuous increase in capacity on extended cycling. To explain this latter behavior, various electrochem. measurements and ex situ x-ray diffraction are performed. Both cyclic voltammetry and ex situ x-ray diffraction reveal that an accumulation of transition metal atoms (Cr or Mn) in the lithium layer with cycling results in a monoclinic phase and capacity increase. Studies using a.c. impedance spectroscopy reveal that the structural change mainly occurs during the charging process.

ST lithium battery capacity chromium lithium manganese oxide cathode

IT 693252-41-4, Chromium lithium manganese oxide ( $\text{Cr}_{0.2}\text{Li}_{1.27}\text{Mn}_{0.53}\text{O}_2$ )  
RL: DEV (Device component use); USES (Uses)  
(increase of capacity of lithium batteries based on chromium lithium manganese oxide cathode)

L2 ANSWER 10 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:451461 CAPLUS

DOCUMENT NUMBER: 141:9626

TITLE: Preparation of layered lithium chromium manganese oxides as cathode material in lithium batteries

INVENTOR(S): Wu, Xianglan; Park, Yong Joon; Ryu, Kwang Sun; Chang, Soon Ho; Hong, Young-Sik

PATENT ASSIGNEE(S): Electronics and Telecommunications Research Institute, S. Korea



SOURCE: U.S. Pat. Appl. Publ., 7 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004105809	A1	20040603	US 2003-648614	20030825
US 6908708	B2	20050621		
KR 2004047252	A	20040605	KR 2002-75395	20021129
JP 2004186145	A2	20040702	JP 2003-383007	20031112
JP 3645561	B2	20050511		

PRIORITY APPLN. INFO.: KR 2002-75395 A 20021129  
 REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST layered lithium chromium manganese oxide prepn lithium battery cathode  
 IT Battery cathodes  
 (preparation of layered lithium chromium manganese oxides as cathode material in lithium batteries)  
 IT 693252-41-4P, Chromium lithium manganese oxide  
 (Cr<sub>0.2</sub>Li<sub>1.27</sub>Mn<sub>0.53</sub>O<sub>2</sub>)  
 RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); USES (Uses)  
 (cathode material; preparation of layered lithium chromium manganese oxides as cathode material in lithium batteries)

L2 ANSWER 11 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:338909 CAPLUS  
 DOCUMENT NUMBER: 141:245952  
 TITLE: Properties of Li[Cr<sub>x</sub>Li<sub>(1-x)</sub>/3Mn<sub>2(1-x)</sub>/3]O<sub>2</sub>  
 (0.1≤x≤0.2) material prepared by quenching  
 AUTHOR(S): Wu, Xianglan; Ryu, Kwang Sun; Hong, Young-Sik; Park, Yong Joon; Chang, Soon Ho  
 CORPORATE SOURCE: Basic Research Laboratory, Electronics and Telecommunications Research Institute, 161 Gajeong-dong, Yuseong-gu, Daejeon, 305-350, S. Korea  
 SOURCE: Journal of Power Sources (2004), 132(1-2), 219-224  
 CODEN: JPSODZ; ISSN: 0378-7753  
 PUBLISHER: Elsevier Science B.V.  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 REFERENCE COUNT: 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST chromium lithium manganese oxide electrode quenching lithium battery  
 IT Battery electrodes  
 Quenching (cooling)  
 (chromium lithium manganese oxide electrode material prepared by quenching for lithium batteries)  
 IT 681849-68-3, Chromium lithium manganese oxide (Cr<sub>0.1</sub>Li<sub>1.3</sub>Mn<sub>0.6</sub>O<sub>2</sub>)  
 693252-41-4, Chromium lithium manganese oxide  
 (Cr<sub>0.2</sub>Li<sub>1.27</sub>Mn<sub>0.53</sub>O<sub>2</sub>) 749913-31-3, Chromium lithium manganese oxide (Cr<sub>0.15</sub>Li<sub>1.28</sub>Mn<sub>0.57</sub>O<sub>2</sub>)  
 RL: DEV (Device component use); PRP (Properties); USES (Uses)  
 (chromium lithium manganese oxide electrode material prepared by quenching for lithium batteries)

L2 ANSWER 12 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:295664 CAPLUS  
 DOCUMENT NUMBER: 141:108755  
 TITLE: Electrochemical properties of Li-Cr-Mn-O cathode materials for lithium secondary batteries  
 AUTHOR(S): Kim, Kwang-Soo; Lee, Seung-Won; Moon, Hee-Soo; Kim, Hyun-Joong; Cho, Byung-Won; Cho, Won-Il; Choi, Jin-Beom; Park, Jong-Wan  
 CORPORATE SOURCE: Division of Materials Science and Engineering, Hanyang University, Seongdong-Gu, Seoul, 133-791, S. Korea  
 SOURCE: Journal of Power Sources (2004), 129(2), 319-323  
 CODEN: JPSODZ; ISSN: 0378-7753  
 PUBLISHER: Elsevier Science B.V.  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 REFERENCE COUNT: 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT  
 ST chromium lithium manganese oxide cathode lithium battery  
 IT Battery cathodes  
 (chromium lithium manganese layered oxides as cathode materials for lithium batteries)  
 IT 719301-79-8, Chromium lithium manganese oxide (Cr<sub>0.15</sub>Li<sub>1.13</sub>Mn<sub>0.73</sub>O<sub>2</sub>)  
 RL: DEV (Device component use); USES (Uses)  
 (chromium lithium manganese layered oxides as cathode materials for lithium batteries)

L2 ANSWER 13 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:207338 CAPLUS  
 DOCUMENT NUMBER: 140:360196  
 TITLE: Electrochemical and in situ synchrotron x-ray diffraction studies of Li[Li<sub>0.3</sub>Cr<sub>0.1</sub>Mn<sub>0.6</sub>]O<sub>2</sub> cathode materials  
 AUTHOR(S): Wang, G. X.; Guo, Z. P.; Yang, X. Q.; McBreen, J.; Liu, H. K.; Dou, S. X.  
 CORPORATE SOURCE: ISEM, University of Wollongong, Wollongong, 2500, Australia  
 SOURCE: Solid State Ionics (2004), 167(1-2), 183-189  
 CODEN: SSIOD3; ISSN: 0167-2738  
 PUBLISHER: Elsevier Science B.V.  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT  
 ST chromium lithium manganese oxide cathode battery  
 IT Battery cathodes  
 (preparation and electrochem. and in situ synchrotron x-ray diffraction studies of chromium lithium manganese oxide cathode material for batteries)  
 IT 681849-68-3, Chromium lithium manganese oxide (Cr<sub>0.1</sub>Li<sub>1.3</sub>Mn<sub>0.6</sub>O<sub>2</sub>)  
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
 (preparation and electrochem. and in situ synchrotron x-ray diffraction studies of chromium lithium manganese oxide cathode material for batteries)

L2 ANSWER 14 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:20178 CAPLUS  
 DOCUMENT NUMBER: 140:79796  
 TITLE: Oxide cathode materials, their manufacture, and batteries using them  
 INVENTOR(S): Li, Guo-Hua  
 PATENT ASSIGNEE(S): Sony Corp., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 18 pp.

DOCUMENT TYPE: CODEN: JKXXAF  
LANGUAGE: Patent  
FAMILY ACC. NUM. COUNT: 1 Japanese  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004006293	A2	20040108	JP 2003-100758	20030403
US 2004234855	A1	20041125	US 2004-813542	20040330
TW 245443	B1	20051211	TW 2004-93109008	20040401
KR 2004086813	A	20041012	KR 2004-22854	20040402
CN 1571193	A	20050126	CN 2004-10071488	20040403
PRIORITY APPLN. INFO.:			JP 2002-102177	A 20020404
			JP 2003-100758	A 20030403

ST battery cathode lithium manganese chromium oxide; titanium  
magnesium aluminum lithium oxide battery

IT Battery cathodes  
Secondary batteries

(manufacture of Li-based mixed oxide cathode materials for batteries with  
good charge-discharge capacity and long cycle life)

IT 640772-79-8 640772-80-1

RL: DEV (Device component use); USES (Uses)

(manufacture of Li-based mixed oxide cathode materials for batteries with  
good charge-discharge capacity and long cycle life)

IT 640772-72-1P 640772-73-2P 640772-74-3P

640772-75-4P 640772-76-5P 640772-77-6P

640772-78-7P

RL: DEV (Device component use); IMF (Industrial manufacture); PREP  
(Preparation); USES (Uses)

(manufacture of Li-based mixed oxide cathode materials for batteries with  
good charge-discharge capacity and long cycle life)

L2 ANSWER 15 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:591490 CAPLUS

DOCUMENT NUMBER: 139:152299

TITLE: Positive plate active material and nonaqueous  
electrolyte secondary cell using same

INVENTOR(S): Hosoya, Yosuke; Yamamoto, Yoshikatsu; Sato, Takashi

PATENT ASSIGNEE(S): Sony Corporation, Japan

SOURCE: PCT Int. Appl., 113 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003063275	A1	20030731	WO 2003-JP65	20030108
W: CN, KR, US				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE,				
IT, LU, MC, NL, PT, SE, SI, SK, TR				
JP 2003203631	A2	20030718	JP 2002-1724	20020108
JP 2004134207	A2	20040430	JP 2002-296962	20021010
JP 2004139853	A2	20040513	JP 2002-303684	20021018
EP 1465271	A1	20041006	EP 2003-700481	20030108
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,				
IE, SI, FI, CY, TR, BG, CZ, EE, HU, SK				
US 2004076882	A1	20040422	US 2003-468900	20030826
PRIORITY APPLN. INFO.:			JP 2002-1724	A 20020108
			JP 2002-296962	A 20021010
			JP 2002-303684	A 20021018

REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST nonaq electrolyte lithium secondary battery pos plate  
IT 476467-57-9, Cobalt lithium nickel oxide (Co0.3Li1.02Ni0.7O2)  
561307-96-8, Aluminum cobalt lithium nickel oxide  
(Al0.05Co0.25Li1.02Ni0.7O2) 561307-99-1, Cobalt iron lithium nickel  
oxide (Co0.25Fe0.05Li1.02Ni0.7O2) 561308-01-8, Cobalt lithium nickel tin  
oxide (Co0.25Li1.02Ni0.7Sn0.05O2) 561308-03-0, Chromium cobalt lithium  
nickel oxide (Cr0.05Co0.25Li1.02Ni0.7O2) 561308-04-1, Cobalt lithium  
nickel vanadium oxide (Co0.25Li1.02Ni0.7V0.05O2) 561308-05-2, Cobalt  
lithium nickel titanium oxide (Co0.25Li1.02Ni0.7Ti0.05O2) 561308-06-3,  
Cobalt lithium magnesium nickel oxide (Co0.25Li1.02Mg0.05Ni0.7O2)  
561308-08-5, Cobalt gallium lithium nickel oxide  
(Co0.25Ga0.05Li1.02Ni0.7O2) 561308-09-6, Lithium manganese nickel oxide  
(Li1.02Mn0.35Ni0.65O2) 561308-11-0, Iron lithium manganese nickel oxide  
(Fe0.05Li1.02Mn0.3Ni0.65O2) 561308-12-1, Cobalt lithium manganese nickel  
oxide (Co0.05Li1.02Mn0.3Ni0.65O2) 561308-13-2, Lithium manganese nickel  
zinc oxide (Li1.02Mn0.3Ni0.65Zn0.05O2) 561308-14-3, Lithium manganese  
nickel tin oxide (Li1.02Mn0.3Ni0.65Sn0.05O2) 561308-15-4,  
Chromium lithium manganese nickel oxide (Cr0.05Li1.02Mn0.3Ni0.65O2)  
561308-16-5, Lithium manganese nickel vanadium oxide  
(Li1.02Mn0.3Ni0.65V0.05O2) 561308-17-6, Lithium manganese nickel  
titanium oxide (Li1.02Mn0.3Ni0.65Ti0.05O2) 561308-18-7, Lithium  
magnesium manganese nickel oxide (Li1.02Mg0.05Mn0.3Ni0.65O2)  
561308-19-8, Gallium lithium manganese nickel oxide  
(Ga0.05Li1.02Mn0.3Ni0.65O2) 561308-20-1, Aluminum lithium manganese  
nickel oxide (Al0.05Li1.02Mn0.05Ni0.9O2) 561308-21-2, Aluminum cobalt  
lithium nickel oxide (Al0.05Co0.05Li1.02Ni0.9O2) 561308-22-3, Aluminum  
cobalt lithium nickel oxide (Al0.05Co0.5Li1.02Ni0.45O2) 561308-23-4,  
Aluminum lithium manganese nickel oxide (Al0.05Li1.02Mn0.5Ni0.45O2)  
569668-39-9, Aluminum lithium manganese nickel oxide  
(Al0.05Li1.02Mn0.3Ni0.65O2)  
RL: DEV (Device component use); USES (Uses)  
(pos. plate active material for nonaq. electrolyte Li secondary cell)

L2 ANSWER 16 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:550629 CAPLUS

DOCUMENT NUMBER: 139:119901

TITLE: Cathode active materials and nonaqueous electrolyte  
secondary batteries

INVENTOR(S): Hosoya, Yosuke; Yamamoto, Yoshikatsu

PATENT ASSIGNEE(S): Sony Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 17 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2003203631	A2	20030718	JP 2002-1724	20020108
WO 2003063275	A1	20030731	WO 2003-JP65	20030108
W: CN, KR, US				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR				
CN 1515041	A	20040721	CN 2003-800053	20030108
EP 1465271	A1	20041006	EP 2003-700481	20030108
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, CY, TR, BG, CZ, EE, HU, SK				
US 2004076882	A1	20040422	US 2003-468900	20030826
PRIORITY APPLN. INFO.:			JP 2002-1724	A 20020108

JP 2002-296962 A 20021010  
 JP 2002-303684 A 20021018  
 WO 2003-JP65 W 20030108

ST nonaq electrolyte secondary battery cathode active material;  
 lithium nickel cobalt mixed oxide battery cathode; manganese  
 lithium nickel mixed oxide battery cathode

IT Battery cathodes  
 (mixts. of layered Ni Co mixed oxides and layered Ni Mn mixed oxides as  
 cathode active materials for nonaq. electrolyte secondary batteries)

IT 116327-68-5P, Cobalt lithium nickel oxide (Co<sub>0.3</sub>LiNi<sub>0.7</sub>O<sub>2</sub>) 561307-96-8P,  
 Aluminum cobalt lithium nickel oxide (Al<sub>0.05</sub>Co<sub>0.25</sub>Li<sub>1.02</sub>Ni<sub>0.7</sub>O<sub>2</sub>)  
 561307-99-1P, Cobalt iron lithium nickel oxide (Co<sub>0.25</sub>Fe<sub>0.05</sub>Li<sub>1.02</sub>Ni<sub>0.7</sub>O<sub>2</sub>)  
 561308-01-8P, Cobalt lithium nickel tin oxide (Co<sub>0.25</sub>Li<sub>1.02</sub>Ni<sub>0.7</sub>Sn<sub>0.05</sub>O<sub>2</sub>)  
 561308-03-0P, Chromium cobalt lithium nickel oxide  
 (Cr<sub>0.05</sub>Co<sub>0.25</sub>Li<sub>1.02</sub>Ni<sub>0.7</sub>O<sub>2</sub>) 561308-04-1P, Cobalt lithium nickel vanadium  
 oxide (Co<sub>0.25</sub>Li<sub>1.02</sub>Ni<sub>0.7</sub>V<sub>0.05</sub>O<sub>2</sub>) 561308-05-2P, Cobalt lithium nickel  
 titanium oxide (Co<sub>0.25</sub>Li<sub>1.02</sub>Ni<sub>0.7</sub>Ti<sub>0.05</sub>O<sub>2</sub>) 561308-06-3P, Cobalt lithium  
 magnesium nickel oxide (Co<sub>0.25</sub>Li<sub>1.02</sub>Mg<sub>0.05</sub>Ni<sub>0.7</sub>O<sub>2</sub>) 561308-08-5P, Cobalt  
 gallium lithium nickel oxide (Co<sub>0.25</sub>Ga<sub>0.05</sub>Li<sub>1.02</sub>Ni<sub>0.7</sub>O<sub>2</sub>) 561308-09-6P,  
 Lithium manganese nickel oxide (Li<sub>1.02</sub>Mn<sub>0.35</sub>Ni<sub>0.65</sub>O<sub>2</sub>) 561308-11-0P, Iron  
 lithium manganese nickel oxide (Fe<sub>0.05</sub>Li<sub>1.02</sub>Mn<sub>0.3</sub>Ni<sub>0.65</sub>O<sub>2</sub>) 561308-12-1P,  
 Cobalt lithium manganese nickel oxide (Co<sub>0.05</sub>Li<sub>1.02</sub>Mn<sub>0.3</sub>Ni<sub>0.65</sub>O<sub>2</sub>)  
 561308-13-2P, Lithium manganese nickel zinc oxide  
 (Li<sub>1.02</sub>Mn<sub>0.3</sub>Ni<sub>0.65</sub>Zn<sub>0.05</sub>O<sub>2</sub>) 561308-14-3P, Lithium manganese nickel tin  
 oxide (Li<sub>1.02</sub>Mn<sub>0.3</sub>Ni<sub>0.65</sub>Sn<sub>0.05</sub>O<sub>2</sub>) 561308-15-4P, Chromium lithium  
 manganese nickel oxide (Cr<sub>0.05</sub>Li<sub>1.02</sub>Mn<sub>0.3</sub>Ni<sub>0.65</sub>O<sub>2</sub>) 561308-16-5P, Lithium  
 manganese nickel vanadium oxide (Li<sub>1.02</sub>Mn<sub>0.3</sub>Ni<sub>0.65</sub>V<sub>0.05</sub>O<sub>2</sub>) 561308-17-6P,  
 Lithium manganese nickel titanium oxide (Li<sub>1.02</sub>Mn<sub>0.3</sub>Ni<sub>0.65</sub>Ti<sub>0.05</sub>O<sub>2</sub>)  
 561308-18-7P, Lithium magnesium manganese nickel oxide  
 (Li<sub>1.02</sub>Mg<sub>0.05</sub>Mn<sub>0.3</sub>Ni<sub>0.65</sub>O<sub>2</sub>) 561308-19-8P, Gallium lithium manganese  
 nickel oxide (Ga<sub>0.05</sub>Li<sub>1.02</sub>Mn<sub>0.3</sub>Ni<sub>0.65</sub>O<sub>2</sub>) 561308-20-1P, Aluminum lithium  
 manganese nickel oxide (Al<sub>0.05</sub>Li<sub>1.02</sub>Mn<sub>0.05</sub>Ni<sub>0.9</sub>O<sub>2</sub>) 561308-21-2P,  
 Aluminum cobalt lithium nickel oxide (Al<sub>0.05</sub>Co<sub>0.05</sub>Li<sub>1.02</sub>Ni<sub>0.9</sub>O<sub>2</sub>)  
 561308-22-3P, Aluminum cobalt lithium nickel oxide  
 (Al<sub>0.05</sub>Co<sub>0.5</sub>Li<sub>1.02</sub>Ni<sub>0.45</sub>O<sub>2</sub>) 561308-23-4P, Aluminum lithium manganese  
 nickel oxide (Al<sub>0.05</sub>Li<sub>1.02</sub>Mn<sub>0.5</sub>Ni<sub>0.45</sub>O<sub>2</sub>)  
 RL: DEV (Device component use); IMF (Industrial manufacture); TEM  
 (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (mixts. of layered Ni Co mixed oxides and layered Ni Mn mixed oxides as  
 cathode active materials for nonaq. electrolyte secondary batteries)

L2 ANSWER 17 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN.

ACCESSION NUMBER: 2003:516233 CAPLUS

DOCUMENT NUMBER: 139:263240

TITLE: In situ and ex situ XRD investigation of  
 Li[Cr<sub>x</sub>Li<sub>1/3-x/3</sub>Mn<sub>2/3-2x/3</sub>]O<sub>2</sub> (x=1/3) cathode material

AUTHOR(S): Lu, Zhonghua; Dahn, J. R.

CORPORATE SOURCE: Department of Physics, Dalhousie University, Halifax,  
 Nova Scotia, B3H 3J5, Can.

SOURCE: Journal of the Electrochemical Society (2003), 150(8),  
 A1044-A1051  
 CODEN: JESQAN; ISSN: 0013-4651

PUBLISHER: Electrochemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

IT Battery cathodes  
 (in-situ and ex-situ X-ray diffraction investigation of  
 Li[Cr<sub>x</sub>Li<sub>1/3-x/3</sub>Mn<sub>2/3-2x/3</sub>]O<sub>2</sub> (x=1/3) battery cathode  
 material)

IT Secondary batteries  
 (lithium; in-situ and ex-situ X-ray diffraction investigation of

Li[Cr<sub>x</sub>Li<sub>1/3-x/3</sub>Mn<sub>2/3-2x/3</sub>]O<sub>2</sub> (x=1/3) battery cathode material)

IT Insertion reaction  
(of lithium ions; in-situ and ex-situ X-ray diffraction investigation of Li[Cr<sub>x</sub>Li<sub>1/3-x/3</sub>Mn<sub>2/3-2x/3</sub>]O<sub>2</sub> (x=1/3) battery cathode material)

IT 497260-93-2, Chromium lithium manganese oxide Cr<sub>0.33</sub>Li<sub>1.22</sub>Mn<sub>0.44</sub>O<sub>2</sub>  
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)  
(in-situ and ex-situ X-ray diffraction investigation of Li[Cr<sub>x</sub>Li<sub>1/3-x/3</sub>Mn<sub>2/3-2x/3</sub>]O<sub>2</sub> (x=1/3) battery cathode material)

L2 ANSWER 18 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:509089 CAPLUS

DOCUMENT NUMBER: 139:232959

TITLE: Lack of Cation Clustering in Li[Ni<sub>x</sub>Li<sub>1/3-2x/3</sub>Mn<sub>2/3-x/3</sub>]O<sub>2</sub> (0 < x ≤ 1/2) and Li[Cr<sub>x</sub>Li<sub>(1-x)/3</sub>Mn<sub>(2-2x)/3</sub>]O<sub>2</sub> (0 < x < 1)

AUTHOR(S): Lu, Zhonghua; Chen, Zhaohui; Dahn, J. R.

CORPORATE SOURCE: Department of Physics and Atmospheric Sciences, Dalhousie University, Halifax, NS, B3H 3J5, Can.

SOURCE: Chemistry of Materials (2003), 15(16), 3214-3220  
CODEN: CMATEX; ISSN: 0897-4756

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

REFERENCE COUNT: 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST battery electrode lithium nickel manganese oxide cation clustering; chromium lithium nickel oxide battery electrode cation clustering; x ray diffraction battery electrode cation clustering

IT Crystal structure  
Space groups  
(of Li[Ni<sub>x</sub>Li<sub>1/3-2x/3</sub>Mn<sub>2/3-x/3</sub>]O<sub>2</sub> (x = 0-0.5) and Li[Cr<sub>x</sub>Li<sub>(1-x)/3</sub>Mn<sub>(2-2x)/3</sub>]O<sub>2</sub> (x= 0-1); lack of cation clustering in examination of lithium nickel manganese chromium oxides as battery electrodes)

IT Battery electrodes  
X-ray diffraction  
(x-ray diffraction in lack of cation clustering in Li[Ni<sub>x</sub>Li<sub>1/3-2x/3</sub>Mn<sub>2/3-x/3</sub>]O<sub>2</sub> (x = 0-0.5) and Li[Cr<sub>x</sub>Li<sub>(1-x)/3</sub>Mn<sub>(2-2x)/3</sub>]O<sub>2</sub> (x= 0-1) as battery electrodes)

IT 12017-96-8, Chromium lithium oxide (CrLiO<sub>2</sub>) 128975-24-6, Lithium manganese nickel oxide (Li<sub>2</sub>MnNiO<sub>4</sub>) 388587-52-8, Lithium manganese nickel oxide (Li<sub>1.11</sub>Mn<sub>0.56</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 388587-53-9, Lithium manganese oxide (Li<sub>1.33</sub>Mn<sub>0.67</sub>O<sub>2</sub>) 474417-01-1, Lithium manganese nickel oxide (Li<sub>1.22</sub>Mn<sub>0.61</sub>Ni<sub>0.17</sub>O<sub>2</sub>) 474417-03-3, Lithium manganese nickel oxide (Li<sub>1.17</sub>Mn<sub>0.58</sub>Ni<sub>0.25</sub>O<sub>2</sub>) 475475-27-5, Lithium manganese nickel oxide (Li<sub>1-1.33</sub>Mn<sub>0.5-0.67</sub>Ni<sub>0-0.50</sub>O<sub>2</sub>) 497260-91-0, Chromium lithium manganese oxide (Cr<sub>0.17</sub>Li<sub>1.28</sub>Mn<sub>0.56</sub>O<sub>2</sub>) 497260-93-2, Chromium lithium manganese oxide (Cr<sub>0.33</sub>Li<sub>1.22</sub>Mn<sub>0.44</sub>O<sub>2</sub>) 497260-94-3, Chromium lithium manganese oxide (Cr<sub>0.25</sub>Li<sub>1.25</sub>Mn<sub>0.50</sub>O<sub>2</sub>) 497260-95-4, Chromium lithium manganese oxide (Cr<sub>0.5</sub>Li<sub>1.17</sub>Mn<sub>0.33</sub>O<sub>2</sub>) 497260-96-5, Chromium lithium manganese oxide (Cr<sub>0.67</sub>Li<sub>1.11</sub>Mn<sub>0.22</sub>O<sub>2</sub>) 497260-97-6, Chromium lithium manganese oxide (Cr<sub>0.83</sub>Li<sub>1.06</sub>Mn<sub>0.11</sub>O<sub>2</sub>) 593267-51-7, Chromium lithium manganese oxide (Cr<sub>0-1</sub>Li<sub>1-1.33</sub>Mn<sub>0.33-0.67</sub>O<sub>2</sub>)  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(battery electrode; lack of cation clustering in examination of lithium nickel manganese chromium oxides as battery electrodes)

L2 ANSWER 19 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:437500 CAPLUS

DOCUMENT NUMBER: 139:294446

TITLE: A comparative study of the thermal stability of  
Li<sub>1-x</sub>CoO<sub>2</sub> and Li<sub>3-x</sub>CrMnO<sub>5</sub> in the presence of 1 M LiPF<sub>6</sub>  
in 3:7 EC/DEC electrolyte using accelerating rate  
calorimetry

AUTHOR(S): Argue, S.; Davidson, I. J.; Ammundsen, B.; Paulsen, J.

CORPORATE SOURCE: ICPET, National Research Council Canada, Ottawa, ON,  
K1A 0R6, Can.

SOURCE: Journal of Power Sources (2003), 119-121, 664-668

CODEN: JPSODZ; ISSN: 0378-7753

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST chromium lithium manganese oxide cathode thermal stability electrolyte  
battery; cobalt lithium oxide cathode thermal stability  
electrolyte battery

IT Carbon black, uses

RL: DEV (Device component use); USES (Uses)

(cathode containing; comparison of thermal stability of lithium  
battery cathode materials Li<sub>1-x</sub>CoO<sub>2</sub> and Li<sub>3-x</sub>CrMnO<sub>5</sub> in LiPF<sub>6</sub>  
electrolyte solns. using accelerating rate calorimetry)

IT Battery cathodes

Calorimetry

Thermal stability

(comparison of thermal stability of lithium battery cathode  
materials Li<sub>1-x</sub>CoO<sub>2</sub> and Li<sub>3-x</sub>CrMnO<sub>5</sub> in LiPF<sub>6</sub> electrolyte solns. using  
accelerating rate calorimetry)

IT Secondary batteries

(lithium; comparison of thermal stability of lithium battery  
cathode materials Li<sub>1-x</sub>CoO<sub>2</sub> and Li<sub>3-x</sub>CrMnO<sub>5</sub> in LiPF<sub>6</sub> electrolyte solns.  
using accelerating rate calorimetry)

IT 9011-17-0

RL: DEV (Device component use); USES (Uses)

(binder; comparison of thermal stability of lithium battery  
cathode materials Li<sub>1-x</sub>CoO<sub>2</sub> and Li<sub>3-x</sub>CrMnO<sub>5</sub> in LiPF<sub>6</sub> electrolyte solns.  
using accelerating rate calorimetry)

IT 7782-42-5, Graphite, uses

RL: DEV (Device component use); USES (Uses)

(cathode containing; comparison of thermal stability of lithium  
battery cathode materials Li<sub>1-x</sub>CoO<sub>2</sub> and Li<sub>3-x</sub>CrMnO<sub>5</sub> in LiPF<sub>6</sub>  
electrolyte solns. using accelerating rate calorimetry)

IT 21324-40-3, Lithium hexafluorophosphate (LiPF<sub>6</sub>)

RL: DEV (Device component use); USES (Uses)

(comparison of thermal stability of lithium battery cathode  
materials Li<sub>1-x</sub>CoO<sub>2</sub> and Li<sub>3-x</sub>CrMnO<sub>5</sub> in LiPF<sub>6</sub> electrolyte solns. using  
accelerating rate calorimetry)

IT 410538-69-1, Chromium lithium manganese oxide (Cr<sub>0.4</sub>Li<sub>1.2</sub>Mn<sub>0.4</sub>O<sub>2</sub>)

RL: DEV (Device component use); PRP (Properties); USES (Uses)

(comparison of thermal stability of lithium battery cathode  
materials Li<sub>1-x</sub>CoO<sub>2</sub> and Li<sub>3-x</sub>CrMnO<sub>5</sub> in LiPF<sub>6</sub> electrolyte solns. using  
accelerating rate calorimetry)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate

RL: DEV (Device component use); USES (Uses)

(electrolyte containing; comparison of thermal stability of lithium  
battery cathode materials Li<sub>1-x</sub>CoO<sub>2</sub> and Li<sub>3-x</sub>CrMnO<sub>5</sub> in LiPF<sub>6</sub>  
electrolyte solns. using accelerating rate calorimetry)

L2 ANSWER 20 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:133636 CAPLUS

DOCUMENT NUMBER: 138:173374  
 TITLE: Improved cathode compositions for lithium ion batteries  
 INVENTOR(S): Dahn, Jeffrey R.; Lu, Zhonghua  
 PATENT ASSIGNEE(S): 3M Innovative Properties Company, USA  
 SOURCE: PCT Int. Appl., 40 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003015198	A2	20030220	WO 2002-US24684	20020802
WO 2003015198	A3	20040401		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
AU 2002355544	A1	20030224	AU 2002-355544	20020802
US 2003108793	A1	20030612	US 2002-210919	20020802
EP 1425810	A2	20040609	EP 2002-794657	20020802
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK				
JP 2004538610	T2	20041224	JP 2003-520018	20020802
CN 1582509	A	20050216	CN 2002-815406	20020802
TW 557598	B	20031011	TW 2002-91117676	20020806
US 2006159994	A1	20060720	US 2005-317607	20051223
PRIORITY APPLN. INFO.:				
			US 2001-310622P	P 20010807
			US 2002-210919	B1 20020802
			WO 2002-US24684	W 20020802

AB A cathode composition for a lithium ion battery that contains lithium having the formula (a)  $\text{Li}_y[\text{M}_1(1-b)\text{Mn}b]\text{O}_2$  or (b)  $\text{Li}_y[\text{M}_1(1-b)\text{Mn}b]\text{O}_{1.5+c}$  where  $0 \leq y < 1$ ,  $0 < b < 1$  and  $0 < c < 0.5$  and  $\text{M}_1$  represents one or more metal elements, with the proviso that for (a)  $\text{M}_1$  is a metal element other than chromium. The composition is in a form of a single phase having an O3 crystal structure that does not undergo a phase transformation to a spinel crystal structure when incorporated in a lithium-ion battery and cycled for 100 full charge-discharge cycles at 30-C and a final capacity of 130 mAh/g using a discharge current of 30 mA/g.

ST lithium ion battery cathode compn

IT Battery cathodes

(improved cathode compns. for lithium ion batteries)

IT 12017-96-8P, Chromium lithium oxide  $\text{CrLiO}_2$  128975-24-6P, Lithium manganese nickel oxide  $\text{LiMn}_{0.5}\text{Ni}_{0.5}\text{O}_2$  162684-16-4P, Lithium manganese nickel oxide 204450-96-4P, Chromium lithium manganese oxide 388587-52-8P, Lithium manganese nickel oxide  $\text{Li}_{1.1}\text{Mn}_{0.56}\text{Ni}_{0.33}\text{O}_2$  388587-54-0DP, Lithium manganese nickel oxide ( $\text{Li}_{1.06}\text{Mn}_{0.53}\text{Ni}_{0.42}\text{O}_2$ ), Lithium manganese nickel oxide  $\text{Li}_{1.06}\text{Mn}_{0.53}\text{Ni}_{0.42}\text{O}_2$  474416-98-3P, Lithium manganese nickel oxide  $\text{Li}_{1.28}\text{Mn}_{0.64}\text{Ni}_{0.08}\text{O}_2$  474417-01-1P, Lithium manganese nickel oxide  $\text{Li}_{1.22}\text{Mn}_{0.61}\text{Ni}_{0.17}\text{O}_2$  474417-03-3P, Lithium manganese nickel oxide  $\text{Li}_{1.17}\text{Mn}_{0.58}\text{Ni}_{0.25}\text{O}_2$  497260-91-0P, Chromium lithium manganese oxide ( $\text{Cr}_{0.17}\text{Li}_{1.28}\text{Mn}_{0.56}\text{O}_2$ ) 497260-93-2P, Chromium lithium manganese oxide ( $\text{Cr}_{0.33}\text{Li}_{1.22}\text{Mn}_{0.44}\text{O}_2$ ) 497260-94-3P, Chromium lithium manganese oxide ( $\text{Cr}_{0.25}\text{Li}_{1.25}\text{Mn}_{0.50}\text{O}_2$ ) 497260-95-4P, Chromium lithium



manganese oxide ( $\text{Cr}_{0.5}\text{Li}_{1.17}\text{Mn}_{0.33}\text{O}_2$ ) 497260-96-5P, Chromium  
lithium manganese oxide ( $\text{Cr}_{0.67}\text{Li}_{1.11}\text{Mn}_{0.22}\text{O}_2$ ) 497260-97-6P,  
Chromium lithium manganese oxide ( $\text{Cr}_{0.83}\text{Li}_{1.06}\text{Mn}_{0.11}\text{O}_2$ )  
RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(improved cathode compns. for lithium ion batteries)

L2 ANSWER 21 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2002:781968 CAPLUS  
DOCUMENT NUMBER: 138:224061  
TITLE: Structure and electrochemistry of layered  
 $\text{Li}[\text{Cr}_x\text{Li}_{(1/3-x/3)}\text{Mn}_{(2/3-2x/3)}]\text{O}_2$   
AUTHOR(S): Lu, Zhonghua; Dahn, J. R.  
CORPORATE SOURCE: Department of Physics, Dalhousie University, Halifax,  
NS, B3H 3J5, Can.  
SOURCE: Journal of the Electrochemical Society (2002),  
149(11), A1454-A1459  
CODEN: JESOAN; ISSN: 0013-4651  
PUBLISHER: Electrochemical Society  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
REFERENCE COUNT: 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST electrochem structure layered lithium chromium manganese oxide;  
battery cathode lithium chromium manganese oxide structure; cobalt  
lithium oxide isostructural chromium manganese solid soln  
IT Sol-gel processing  
(for fabrication of layered  $\text{Li}[\text{Cr}_x\text{Li}_{(1/3-x/3)}\text{Mn}_{(2/3-2x/3)}]\text{O}_2$  mixed  
oxides as candidate battery cathodes)  
IT Battery cathodes  
(structure and electrochem. of layered  $\text{Li}[\text{Cr}_x\text{Li}_{(1/3-x/3)}\text{Mn}_{(2/3-2x/3)}]\text{O}_2$   
mixed oxides as candidate battery cathodes)  
IT 12017-96-8P, Chromium lithium oxide ( $\text{CrLiO}_2$ ) 497260-91-0P,  
Chromium lithium manganese oxide ( $\text{Cr}_{0.17}\text{Li}_{1.28}\text{Mn}_{0.56}\text{O}_2$ )  
497260-93-2P, Chromium lithium manganese oxide  
( $\text{Cr}_{0.33}\text{Li}_{1.22}\text{Mn}_{0.44}\text{O}_2$ ) 497260-94-3P, Chromium lithium manganese  
oxide ( $\text{Cr}_{0.25}\text{Li}_{1.25}\text{Mn}_{0.50}\text{O}_2$ ) 497260-95-4P, Chromium lithium  
manganese oxide ( $\text{Cr}_{0.5}\text{Li}_{1.17}\text{Mn}_{0.33}\text{O}_2$ ) 497260-96-5P, Chromium  
lithium manganese oxide ( $\text{Cr}_{0.67}\text{Li}_{1.11}\text{Mn}_{0.22}\text{O}_2$ ) 497260-97-6P,  
Chromium lithium manganese oxide ( $\text{Cr}_{0.83}\text{Li}_{1.06}\text{Mn}_{0.11}\text{O}_2$ )  
500341-54-8P, Chromium lithium manganese oxide  
( $\text{Cr}_{0.1}\text{Li}_{1.13}\text{Mn}_{0.067}\text{O}_2$ )  
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic  
preparation); PREP (Preparation); USES (Uses)  
(structure and electrochem. of layered  $\text{Li}[\text{Cr}_x\text{Li}_{(1/3-x/3)}\text{Mn}_{(2/3-2x/3)}]\text{O}_2$   
mixed oxides as candidate battery cathodes)

L2 ANSWER 22 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2002:316799 CAPLUS  
DOCUMENT NUMBER: 137:172312  
TITLE: Local structure and first cycle redox mechanism of  
layered  $\text{Li}_{1.2}\text{Cr}_{0.4}\text{Mn}_{0.4}\text{O}_2$  cathode material  
AUTHOR(S): Ammundsen, Brett; Paulsen, Jens; Davidson, Isobel;  
Liu, Ru-Shi; Shen, Chih-Hung; Chen, Jin-Ming; Jang,  
Ling-Yun; Lee, Jyh-Fu  
CORPORATE SOURCE: Pacific Lithium (New Zealand) Limited, Auckland, N. Z.  
SOURCE: Journal of the Electrochemical Society (2002), 149(4),  
A431-A436  
CODEN: JESOAN; ISSN: 0013-4651  
PUBLISHER: Electrochemical Society  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
REFERENCE COUNT: 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS

RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST chromium lithium manganese oxide cathode structure redox mechanism;  
battery chromium lithium manganese oxide cathode  
IT Battery cathodes  
(local structure and first cycle redox mechanism of layered chromium  
lithium manganese oxide cathode material for batteries)  
IT 410538-69-1, Chromium lithium manganese oxide ( $\text{Cr}_{0.4}\text{Li}_{1.2}\text{Mn}_{0.4}\text{O}_2$ )  
RL: DEV (Device component use); TEM (Technical or engineered material  
use); USES (Uses)  
(local structure and first cycle redox mechanism of layered chromium  
lithium manganese oxide cathode material for batteries)

L2 ANSWER 23 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2002:252583 CAPLUS

DOCUMENT NUMBER: 137:22319

TITLE: 6Li MAS NMR studies of the local structure and  
electrochemical properties of Cr-doped lithium  
manganese and lithium cobalt oxide cathode materials  
for lithium-ion batteries

AUTHOR(S): Pan, Chanjuan; Lee, Young Joo; Ammundsen, Brett; Grey,  
Clare P.

CORPORATE SOURCE: Department of Chemistry, State University of New York  
at Stony Brook, Stony Brook, NY, 11794-3400, USA

SOURCE: Chemistry of Materials (2002), 14(5), 2289-2299

CODEN: CMATEX; ISSN: 0897-4756

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

REFERENCE COUNT: 39 THERE ARE 39 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST battery cathode chromium lithium manganese oxide lithium cobalt  
oxide  
IT Battery cathodes  
(6Li MAS NMR studies of the local structure and electrochem. properties  
of Cr-doped lithium manganese and lithium cobalt oxide cathode  
materials for lithium-ion batteries)  
IT 164175-43-3, Chromium lithium manganese oxide ( $\text{Cr}_{0.1}\text{Li}_2\text{Mn}_{1.9}\text{O}_4$ )  
188651-66-3, Chromium lithium manganese oxide ( $\text{Cr}_{0.2}\text{Li}_2\text{Mn}_{1.8}\text{O}_4$ )  
198213-52-4, Chromium cobalt lithium oxide ( $\text{Cr}_{0.05}\text{Co}_{0.95}\text{LiO}_2$ )  
207990-17-8, Chromium lithium manganese oxide ( $\text{Cr}_{0.2}\text{LiMn}_{0.8}\text{O}_2$ )  
221332-94-1, Chromium cobalt lithium oxide ( $\text{Cr}_{0.1}\text{Co}_{0.9}\text{LiO}_2$ ) 264144-46-9,  
Chromium lithium manganese oxide ( $\text{Cr}_{0.03}\text{LiMn}_{0.97}\text{O}_2$ ) 410538-69-1,  
Chromium lithium manganese oxide ( $\text{Cr}_{0.4}\text{Li}_{1.2}\text{Mn}_{0.4}\text{O}_2$ ) 435268-40-9,  
Chromium cobalt lithium oxide ( $(\text{Cr},\text{Co})\text{LiO}_2$ ) 435268-41-0, Chromium  
lithium manganese oxide ( $(\text{Cr},\text{Mn})\text{LiO}_2$ ) 435268-42-1, Chromium cobalt  
lithium oxide ( $\text{Cr}_{0.03}\text{Co}_{0.97}\text{LiO}_2$ ) 435268-43-2, Chromium cobalt lithium  
oxide ( $\text{Cr}_{0.9}\text{Co}_{0.1}\text{LiO}_2$ ) 435268-44-3, Chromium cobalt lithium oxide  
( $\text{Cr}_{0.95}\text{Co}_{0.05}\text{LiO}_2$ ) 435268-45-4, Chromium cobalt lithium oxide  
( $\text{Cr}_{0.97}\text{Co}_{0.03}\text{LiO}_2$ )  
RL: PEP (Physical, engineering or chemical process); PRP (Properties);  
PROC (Process)  
(6Li MAS NMR studies of the local structure and electrochem. properties  
of Cr-doped lithium manganese and lithium cobalt oxide cathode  
materials for lithium-ion batteries)

L2 ANSWER 24 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2002:252281 CAPLUS

DOCUMENT NUMBER: 137:65638

TITLE: Rechargeable lithium-ion battery cathodes:  
In-situ XAS

AUTHOR(S): McBreen, J.; Balasubramanian, M.

CORPORATE SOURCE: Materials Science Department, Brookhaven National  
Laboratory, Upton, NY, 11973, USA

SOURCE: JOM (2002), 54(3), 25-28  
 CODEN: JOMMER; ISSN: 1047-4838  
 PUBLISHER: Minerals, Metals & Materials Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 REFERENCE COUNT: 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

TI Rechargeable lithium-ion battery cathodes: In-situ XAS  
 ST cathode lithium ion battery x ray absorption spectroscopy  
 IT Battery cathodes  
 (in-situ XAS study of cathodes for lithium-ion batteries)  
 IT 143623-51-2, Cobalt lithium nickel oxide (Co<sub>0.15</sub>LiNi<sub>0.85</sub>O<sub>2</sub>) 229958-96-7,  
 Cobalt nickel oxide (Co<sub>0.15</sub>Ni<sub>0.85</sub>O<sub>2</sub>) 300408-33-7, Cobalt lithium nickel  
 oxide (Co<sub>0.15</sub>Li<sub>0.8</sub>Ni<sub>0.85</sub>O<sub>2</sub>) 300408-38-2, Cobalt lithium nickel oxide  
 (Co<sub>0.15</sub>Li<sub>0.5</sub>Ni<sub>0.85</sub>O<sub>2</sub>) 300408-40-6, Cobalt lithium nickel oxide  
 (Co<sub>0.15</sub>Li<sub>0.3</sub>Ni<sub>0.85</sub>O<sub>2</sub>) 410538-69-1, Chromium lithium manganese  
 oxide (Cr<sub>0.4</sub>Li<sub>1.2</sub>Mn<sub>0.4</sub>O<sub>2</sub>)  
 RL: DEV (Device component use); USES (Uses)  
 (cathode; in-situ XAS study of cathodes for lithium-ion batteries)

L2 ANSWER 25 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2001:324387 CAPLUS  
 DOCUMENT NUMBER: 134:342495  
 TITLE: compositions of granular lithium manganese oxides,  
 their manufacture, and secondary batteries  
 INVENTOR(S): Fukai, Kiyoshi; Yanagida, Kunio; Yano, Seiichi  
 PATENT ASSIGNEE(S): Sakai Chemical Industry Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 15 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001122628	A2	20010508	JP 1999-305998	19991027
PRIORITY APPLN. INFO.:			JP 1999-305998	19991027
ST secondary lithium battery cathode manganese oxide; battery cathode substituted rhombic lithium manganese oxide manuf compn				
IT Battery cathodes (compsn. and manufacture of granular substituted rhombic lithium manganese oxides for cathodes in secondary lithium batteries)				
IT 164175-43-3, Chromium lithium manganese oxide (Cr <sub>0.1</sub> Li <sub>2</sub> Mn <sub>1.9</sub> O <sub>4</sub> ) 188651-66-3, Chromium lithium manganese oxide (Cr <sub>0.2</sub> Li <sub>2</sub> Mn <sub>1.8</sub> O <sub>4</sub> ) 207990-17-8, Chromium lithium manganese oxide (Cr <sub>0.2</sub> LiMn <sub>0.8</sub> O <sub>2</sub> ) 207990-19-0, Aluminum lithium manganese oxide (Al <sub>0.05</sub> LiMn <sub>0.95</sub> O <sub>2</sub> ) 264144-46-9, Chromium lithium manganese oxide (Cr <sub>0.03</sub> LiMn <sub>0.97</sub> O <sub>2</sub> ) 338728-74-8, Chromium iron lithium manganese oxide (Cr <sub>0.05</sub> Fe <sub>0.03</sub> LiMn <sub>0.92</sub> O <sub>2</sub> ) 338728-75-9, Chromium iron lithium manganese oxide (Cr <sub>0.05</sub> Fe <sub>0.1</sub> LiMn <sub>0.85</sub> O <sub>2</sub> ) 338728-76-0, Chromium iron lithium manganese oxide (Cr <sub>0.05</sub> Fe <sub>0.2</sub> LiMn <sub>0.75</sub> O <sub>2</sub> ) 338728-77-1, Chromium cobalt lithium manganese oxide (Cr <sub>0.05</sub> Co <sub>0.03</sub> LiMn <sub>0.92</sub> O <sub>2</sub> ) 338728-78-2 338728-79-3, Chromium copper lithium manganese oxide (Cr <sub>0.05</sub> Cu <sub>0.03</sub> LiMn <sub>0.92</sub> O <sub>2</sub> ) 338728-80-6, Cerium chromium lithium manganese oxide (Ce <sub>0.03</sub> Cr <sub>0.05</sub> LiMn <sub>0.92</sub> O <sub>2</sub> ) 338728-81-7 338728-82-8 338728-83-9, Chromium lithium manganese oxide (Cr <sub>0.05</sub> Li <sub>1.05</sub> Mn <sub>0.95</sub> O <sub>2.02</sub> ) 338728-84-0, Chromium lithium manganese oxide (Cr <sub>0.05</sub> Li <sub>0.95</sub> Mn <sub>0.95</sub> O <sub>1.98</sub> ) RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses) (compsn. and manufacture of granular substituted rhombic lithium manganese				

oxides for cathodes in secondary lithium batteries)

L2 ANSWER 26 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2001:152991 CAPLUS  
DOCUMENT NUMBER: 134:195764  
TITLE: Cathode active mass for secondary lithium batteries,  
the cathodes, and the batteries  
INVENTOR(S): Sueyoshi, Tsuyoshi; Miyagi, Hidekazu; Mori,  
Syouichirou  
PATENT ASSIGNEE(S): Mitsubishi Chemical Corporation, Japan  
SOURCE: PCT Int. Appl., 38 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001015252	A1	20010301	WO 2000-JP5338	20000809
W: US				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
JP 2001126731	A2	20010511	JP 2000-246665	20000816
JP 2001261341	A2	20010926	JP 2001-856	20010105
JP 2001261342	A2	20010926	JP 2001-857	20010105
PRIORITY APPLN. INFO.:			JP 1999-232259	A 19990819
			JP 2000-10083	A 20000114
			JP 2000-10084	A 20000114

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST secondary lithium battery cathode oxide mixt; lithium manganese  
oxide crystal mixt battery cathode; spinel tetragonal lithium  
manganese oxide mixt cathode

IT Battery cathodes  
(cathodes from mixts. of different crystal type substituted lithium  
manganese oxides for secondary lithium batteries)

IT 12162-79-7, Lithium manganese oxide (LiMnO<sub>2</sub>) 327181-36-2, Aluminum  
lithium manganese oxide (Al<sub>0.12</sub>Li<sub>1.03</sub>Mn<sub>1.85</sub>O<sub>4</sub>) 327181-38-4,  
Chromium lithium manganese oxide (Cr<sub>0.1</sub>Li<sub>1.05</sub>Mn<sub>0.9</sub>O<sub>2</sub>) 327181-40-8,  
Lithium manganese nickel oxide (Li<sub>2.05</sub>Mn<sub>1.76</sub>Ni<sub>0.2</sub>O<sub>4</sub>) 327181-41-9, Cobalt  
lithium manganese oxide (Co<sub>0.2</sub>Li<sub>2.05</sub>Mn<sub>1.76</sub>O<sub>4</sub>)  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(cathodes from mixts. of different crystal type substituted lithium  
manganese oxides for secondary lithium batteries)

L2 ANSWER 27 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2001:7553 CAPLUS  
DOCUMENT NUMBER: 134:74026  
TITLE: Layered lithium manganese oxide bronze and electrodes  
thereof  
INVENTOR(S): Dahn, Jeffrey R.; Paulsen, Jens M.  
PATENT ASSIGNEE(S): Chemetals Technology Corporation, USA  
SOURCE: U.S., 16 pp.  
CODEN: USXXAM  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6168887	B1	20010102	US 1999-231636	19990115

PRIORITY APPLN. INFO.:

US 1999-231636

19990115

REFERENCE COUNT:

20

THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

AB In a rechargeable battery including a cathode, an anode, and an electrolyte one of the electrodes comprises a layered bronze with a structure comprising a stack of 2 alternative layers (I and II). Layer I has a composition of  $X(MyMn_{1-y})X$  where M is a 3d transition metal or Al and/or Li.  $y = 0-0.4$ , and X is any atom, anion and/or a mixture wherein Mn or M is surrounded by 6 anions forming the corners of an octahedron. Layer II contains Li atoms on L-sites that form a perfect or distorted hexagonal lattice. The stack is subjected to the L sites of layer II being surrounded by 6 atoms or anions that form the corners of an octahedron, a type-II layer forming the corners of an octahedron, the bronze comprising Mn in an oxidation state of less than IV.

ST battery electrode lithium manganese oxide bronze

IT Battery cathodes

(layered lithium manganese oxide bronze and electrodes thereof)

IT 249915-44-4, Lithium manganese oxide  $Li_{0.83}Mn_{0.83}O_2$  249915-53-5, Lithium manganese oxide  $Li_{0.72}Mn_{0.94}O_2$  249915-56-8, Cobalt Lithium manganese oxide  $Co_{0.15}Li_{0.67}Mn_{0.85}O_2$  249915-58-0, Cobalt Lithium manganese oxide  $Co_{0.15}Li_{0.83}Mn_{0.68}O_2$  314263-06-4, Lithium manganese oxide ( $Li_{0.5}-1.7Mn_{0.6}-1.5-2.5$ ) 314263-08-6, Cobalt lithium manganese oxide ( $Co_{0.4}Li_{0.5}-1.3Mn_{0.6}-1.5-2.5$ ) 314263-09-7, Chromium lithium manganese oxide ( $Cr_{0.4}Li_{0.5}-1.3Mn_{0.6}-1.5-2.5$ ) 314263-10-0, Copper lithium manganese oxide ( $Cu_{0.4}Li_{0.5}-1.3Mn_{0.6}-1.5-2.5$ ) 314263-11-1, Aluminum lithium manganese oxide ( $Al_{0.4}Li_{0.5}-1.3Mn_{0.6}-1.5-2.5$ ) 314263-13-3, Iron lithium manganese oxide ( $Fe_{0.4}Li_{0.5}-1.3Mn_{0.6}-1.5-2.5$ ) 314263-15-5, Lithium manganese nickel oxide ( $Li_{0.5}-1.3Mn_{0.6}-1Ni_{0.4}O_{1.5}-2.5$ ) 314263-17-7, Lithium manganese titanium oxide ( $Li_{0.5}-1.3Mn_{0.6}-1Ti_{0.4}O_{1.5}-2.5$ ) 314263-18-8, Lithium manganese vanadium oxide ( $Li_{0.5}-1.3Mn_{0.6}-1V_{0.4}O_{1.5}-2.5$ )

RL: DEV (Device component use); USES (Uses)

(layered lithium manganese oxide bronze and electrodes thereof)

L2 ANSWER 28 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2000:500222 CAPLUS

DOCUMENT NUMBER: 133:214760

TITLE: Effects of Chromium Substitution on the Chemical Bonding Nature and Electrochemical Performance of Layered Lithium Manganese Oxide

AUTHOR(S): Hwang, Seong-Ju; Park, Hyo-Suk; Choy, Jin-Ho; Campet, Guy

CORPORATE SOURCE: National Nanohybrid Materials Laboratory School of Chemistry and Molecular Engineering, Seoul National University, Seoul, 151-747, S. Korea

SOURCE: Journal of Physical Chemistry B (2000), 104(32), 7612-7618

CODEN: JPCBFK; ISSN: 1089-5647

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

REFERENCE COUNT: 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST chromium substitution effect bonding electrochem layered lithium manganese oxide; battery cathode chromium lithium manganese oxide; crystal structure chromium lithium manganese oxide; deintercalation electrochem lithium chromium manganese oxide

IT Battery cathodes

(chromium lithium manganese oxide)

IT 290345-85-6P, Chromium lithium manganese oxide ( $Cr_{0.15}LiMn_{0.85}O_2$ ) 290345-88-9P, Chromium lithium manganese oxide ( $Cr_{0.06}Li_{1.01}Mn_{0.94}O_2$ ) 290345-89-0P, Chromium lithium manganese oxide ( $Cr_{0.11}Li_{1.01}Mn_{0.90}O_2$ ) 290345-90-3P, Chromium lithium

manganese oxide (Cr<sub>0.16</sub>Li<sub>1.02</sub>Mn<sub>0.84</sub>O<sub>2</sub>)

RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(preparation by ion-exchange reaction between  $\alpha$ -NaMn<sub>1-x</sub>Cr<sub>x</sub>O<sub>2</sub> and LiBr: effects of chromium substitution on chemical bonding nature and electrochem. performance of layered lithium manganese oxide)

L2 ANSWER 29 OF 29 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1999:706080 CAPLUS

DOCUMENT NUMBER: 131:312432

TITLE: Cathode active mass for secondary lithium batteries and batteries using them

INVENTOR(S): Miyashita, Takahiro; Kitamura, Hajime; Yamato, Koji; Ota, Satoshi

PATENT ASSIGNEE(S): Chuo Denki Kogyo Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 12 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	---	-----	-----	-----
JP 11307094	A2	19991105	JP 1998-109746	19980420
PRIORITY APPLN. INFO.:			JP 1998-109746	19980420
ST				
lithium nickel manganese cobalt oxide cathode; battery lithium mixed oxide cathode				
IT				
Battery cathodes				
(Li mixed oxides containing Ni, Mn, and Co for cathodes in batteries)				
IT				
247565-29-3, Cobalt lithium manganese nickel oxide (Co <sub>0.15</sub> Li <sub>1.05</sub> Mn <sub>0.2</sub> Ni <sub>0.65</sub> O <sub>2</sub> )			247565-30-6, Cobalt lithium manganese nickel oxide (Co <sub>0.17</sub> Li <sub>0.9</sub> Mn <sub>0.04</sub> Ni <sub>0.79</sub> O <sub>2</sub> )	247565-32-8, Cobalt lithium manganese nickel oxide (Co <sub>0.17</sub> Li <sub>0.92</sub> Mn <sub>0.04</sub> Ni <sub>0.79</sub> O <sub>2</sub> )
247565-33-9, Cobalt lithium manganese nickel oxide (Co <sub>0.17</sub> Li <sub>0.94</sub> Mn <sub>0.04</sub> Ni <sub>0.79</sub> O <sub>2</sub> )			247565-34-0, Cobalt lithium manganese nickel oxide (Co <sub>0.17</sub> Li <sub>0.95</sub> Mn <sub>0.04</sub> Ni <sub>0.79</sub> O <sub>2</sub> )	247565-35-1, Cobalt lithium manganese nickel oxide (Co <sub>0.17</sub> Li <sub>0.98</sub> Mn <sub>0.04</sub> Ni <sub>0.79</sub> O <sub>2</sub> )
247565-36-2, Cobalt lithium manganese nickel oxide (Co <sub>0.17</sub> Li <sub>0.92</sub> Mn <sub>0.04</sub> Ni <sub>0.79</sub> O <sub>2</sub> )			247565-37-3, Cobalt lithium manganese nickel oxide (Co <sub>0.17</sub> Li <sub>1.08</sub> Mn <sub>0.04</sub> Ni <sub>0.79</sub> O <sub>2</sub> )	247565-38-4, Cobalt lithium manganese nickel oxide (Co <sub>0.17</sub> Li <sub>1.15</sub> Mn <sub>0.04</sub> Ni <sub>0.79</sub> O <sub>2</sub> )
247565-39-5, Cobalt lithium manganese nickel oxide (Co <sub>0.2</sub> Li <sub>1.05</sub> Mn <sub>0.02</sub> Ni <sub>0.79</sub> O <sub>2</sub> )			247565-40-8, Cobalt lithium manganese nickel oxide (Co <sub>0.2</sub> Li <sub>1.05</sub> Mn <sub>0.08</sub> Ni <sub>0.79</sub> O <sub>2</sub> )	247565-41-9, Cobalt lithium manganese nickel oxide (Co <sub>0.2</sub> Li <sub>1.05</sub> Mn <sub>0.3</sub> Ni <sub>0.5</sub> O <sub>2</sub> )
247565-42-0, Cobalt lithium manganese nickel oxide (Co <sub>0.2</sub> Li <sub>1.05</sub> Mn <sub>0.4</sub> Ni <sub>0.4</sub> O <sub>2</sub> )			247565-43-1, Lithium manganese nickel oxide (Li <sub>1.05</sub> Mn <sub>0.3</sub> Ni <sub>0.7</sub> O <sub>2</sub> )	247565-45-3, Cobalt lithium manganese nickel oxide (Co <sub>0.03</sub> Li <sub>1.05</sub> Mn <sub>0.3</sub> Ni <sub>0.68</sub> O <sub>2</sub> )
247565-47-5, Cobalt lithium manganese nickel oxide (Co <sub>0.05</sub> Li <sub>1.05</sub> Mn <sub>0.3</sub> Ni <sub>0.65</sub> O <sub>2</sub> )			247565-48-6, Cobalt lithium manganese nickel oxide (Co <sub>0.08</sub> Li <sub>1.05</sub> Mn <sub>0.3</sub> Ni <sub>0.63</sub> O <sub>2</sub> )	247565-50-0, Cobalt lithium manganese nickel oxide (Co <sub>0.1</sub> Li <sub>1.05</sub> Mn <sub>0.3</sub> Ni <sub>0.6</sub> O <sub>2</sub> )
247565-51-1, Cobalt lithium manganese nickel oxide (Co <sub>0.15</sub> Li <sub>1.05</sub> Mn <sub>0.3</sub> Ni <sub>0.55</sub> O <sub>2</sub> )			247565-52-2, Cobalt lithium manganese nickel oxide (Co <sub>0.25</sub> Li <sub>1.05</sub> Mn <sub>0.3</sub> Ni <sub>0.45</sub> O <sub>2</sub> )	247565-53-3
247565-54-4			247565-55-5	247565-57-7
247565-59-9			247565-61-3	247565-63-5
247565-65-7			247565-66-8	247565-69-1
247565-71-5			247565-73-7	247565-76-0
247565-77-1			247565-78-2	247565-79-3
247565-80-6			247565-81-7	247565-82-8

RL: DEV (Device component use); USES (Uses)

(Li mixed oxides containing Ni, Mn, and Co for cathodes in batteries)

=> file reg

COST IN U.S. DOLLARS

SINCE FILE

TOTAL

FULL ESTIMATED COST	ENTRY 60.60	SESSION 80.73
DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)	SINCE FILE ENTRY	TOTAL SESSION
CA SUBSCRIBER PRICE	-6.00	-6.00

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 DICTIONARY FILE UPDATES: 12 DEC 2006 HIGHEST RN 915277-53-1

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 predicted properties as well as tags indicating availability of  
 experimental property data in the original document. For information  
 on property searching in REGISTRY, refer to:

<http://www.cas.org/ONLINE/UG/regprops.html>

=> s (1.01-4)/Li and (0.01-0.99)/Mn and (0.01-0.99)/Cr and (0-1)/Al and (0-1)/Ti  
 and (0-1)/Mg and (1.8-2.5)/O

18959 (1.01-4)/LI  
 27138 (0.01-0.99)/MN  
 11986 (0.01-0.99)/CR  
 346889 (0-1)/AL  
 266161 (0-1)/TI  
 144473 (0-1)/MG  
 5907621 (1.8-2.5)/O

L3 0 (1.01-4)/LI AND (0.01-0.99)/MN AND (0.01-0.99)/CR AND (0-1)/AL  
 AND (0-1)/TI AND (0-1)/MG AND (1.8-2.5)/O

=> s (1.01-4)/Li and (0.01-0.99)/Mn and (0.01-0.99)/Cr and (0-1)/Mg and (1.8-2.5)/O

18959 (1.01-4)/LI  
 27138 (0.01-0.99)/MN  
 11986 (0.01-0.99)/CR  
 144473 (0-1)/MG  
 5907621 (1.8-2.5)/O

L4 1 (1.01-4)/LI AND (0.01-0.99)/MN AND (0.01-0.99)/CR AND (0-1)/MG  
 AND (1.8-2.5)/O

=> s (1.01-4)/Li and (0.01-0.99)/Mn and (0.01-0.99)/Cr and (0-1)/Ti and (1.8-2.5)/O

18959 (1.01-4)/LI  
 27138 (0.01-0.99)/MN  
 11986 (0.01-0.99)/CR  
 266161 (0-1)/TI  
 5907621 (1.8-2.5)/O

L5 5 (1.01-4)/LI AND (0.01-0.99)/MN AND (0.01-0.99)/CR AND (0-1)/TI  
 AND (1.8-2.5)/O

=> file caplus

COST IN U.S. DOLLARS	SINCE FILE	TOTAL
FULL ESTIMATED COST	ENTRY	SESSION
	82.24	162.97
DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)	SINCE FILE	TOTAL
CA SUBSCRIBER PRICE	ENTRY	SESSION
	0.00	-6.00

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 FILE LAST UPDATED: 12 Dec 2006 (20061212/ED)

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=> s 14 and battery  
       2 L4  
       129572 BATTERY  
 L6      2 L4 AND BATTERY

=> s 15 and battery  
       3 L5  
       129572 BATTERY  
 L7      3 L5 AND BATTERY

=> d 16 1-2 ibib

L6 ANSWER 1 OF 2 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2004:1128952 CAPLUS  
 DOCUMENT NUMBER: 142:59801  
 TITLE: Cathode material and secondary lithium battery  
 INVENTOR(S): Li, Guo-Hua  
 PATENT ASSIGNEE(S): Sony Corp., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 21 pp.  
           CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004362934	A2,	20041224	JP 2003-159808	20030604
PRIORITY APPLN. INFO.:			JP 2003-159808	20030604

L6 ANSWER 2 OF 2 CAPLUS COPYRIGHT 2006 ACS on STN



ACCESSION NUMBER: 2004:20178 CAPLUS  
DOCUMENT NUMBER: 140:79796  
TITLE: Oxide cathode materials, their manufacture, and batteries using them  
INVENTOR(S): Li, Guo-Hua  
PATENT ASSIGNEE(S): Sony Corp., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 18 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004006293	A2	20040108	JP 2003-100758	20030403
US 2004234855	A1	20041125	US 2004-813542	20040330
TW 245443	B1	20051211	TW 2004-93109008	20040401
KR 2004086813	A	20041012	KR 2004-22854	20040402
CN 1571193	A	20050126	CN 2004-10071488	20040403
PRIORITY APPLN. INFO.:			JP 2002-102177	A 20020404
			JP 2003-100758	A 20030403

=> d 17 1-3 ibib

L7 ANSWER 1 OF 3 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2005:283977 CAPLUS  
DOCUMENT NUMBER: 142:339119  
TITLE: Method of preparation of cathode composition for lithium batteries  
INVENTOR(S): Wu, Xianglan; Park, Yong Joon; Ryu, Kwang Sun; Chang, Soon Ho  
PATENT ASSIGNEE(S): S. Korea  
SOURCE: U.S. Pat. Appl. Publ., 9 pp.  
CODEN: USXXCO  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2005069772	A1	20050331	US 2004-886077	20040706
KR 2005030459	A	20050330	KR 2003-66949	20030926
JP 2005108818	A2	20050421	JP 2004-237632	20040817
PRIORITY APPLN. INFO.:			KR 2003-66949	A 20030926

L7 ANSWER 2 OF 3 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2004:1128952 CAPLUS  
DOCUMENT NUMBER: 142:59801  
TITLE: Cathode material and secondary lithium battery  
INVENTOR(S): Li, Guo-Hua  
PATENT ASSIGNEE(S): Sony Corp., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 21 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2004362934 A2 20041224 JP 2003-159808 20030604  
PRIORITY APPLN. INFO.: JP 2003-159808 20030604

L7 ANSWER 3 OF 3 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:20178 CAPLUS  
DOCUMENT NUMBER: 140:79796  
TITLE: Oxide cathode materials, their manufacture, and  
batteries using them  
INVENTOR(S): Li, Guo-Hua  
PATENT ASSIGNEE(S): Sony Corp., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 18 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004006293	A2	20040108	JP 2003-100758	20030403
US 2004234855	A1	20041125	US 2004-813542	20040330
TW 245443	B1	20051211	TW 2004-93109008	20040401
KR 2004086813	A	20041012	KR 2004-22854	20040402
CN 1571193	A	20050126	CN 2004-10071488	20040403
PRIORITY APPLN. INFO.:			JP 2002-102177	A 20020404
			JP 2003-100758	A 20030403

=> s l2 and (alumnium or titanium or magnesium or Mg or Al or Ti)

21 ALUMNIUM  
487243 TITANIUM  
471622 MAGNESIUM  
1410998 MG  
987828 AL  
352457 TI

L8 10 L2 AND (ALUMNIUM OR TITANIUM OR MAGNESIUM OR MG OR AL OR TI)

=> d l8 1-10 ibib

L8 ANSWER 1 OF 10 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2006:402355 CAPLUS  
DOCUMENT NUMBER: 144:415971  
TITLE: Method of preparation of conductive agent-cathode  
active material composite for lithium secondary  
battery  
INVENTOR(S): Cheon, Sang-Eun; Yoo, Seok-Yoon; Yoon, Hye-Won; Kim,  
Jae-Kyung  
PATENT ASSIGNEE(S): Samsung Sdi Co., Ltd., S. Korea  
SOURCE: Eur. Pat. Appl., 27 pp.  
CODEN: EPXXDW  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1653534	A1	20060503	EP 2005-110064	20051027
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, BA, HR, IS, YU				
KR 2006037618	A	20060503	KR 2004-86630	20041028
US 2006093920	A1	20060504	US 2005-258731	20051025

CN 1770516 A 20060510 CN 2005-10116672 20051026  
 JP 2006128119 A2 20060518 JP 2005-314501 20051028  
 PRIORITY APPLN. INFO.: KR 2004-86630 A 20041028  
 REFERENCE COUNT: 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 2 OF 10 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2005:283977 CAPLUS  
 DOCUMENT NUMBER: 142:339119  
 TITLE: Method of preparation of cathode composition for  
 lithium batteries  
 INVENTOR(S): Wu, Xianglan; Park, Yong Joon; Ryu, Kwang Sun; Chang,  
 Soon Ho  
 PATENT ASSIGNEE(S): S. Korea  
 SOURCE: U.S. Pat. Appl. Publ., 9 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2005069772	A1	20050331	US 2004-886077	20040706
KR 2005030459	A	20050330	KR 2003-66949	20030926
JP 2005108818	A2	20050421	JP 2004-237632	20040817
PRIORITY APPLN. INFO.:			KR 2003-66949	A 20030926

L8 ANSWER 3 OF 10 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2005:275999 CAPLUS  
 DOCUMENT NUMBER: 142:357994  
 TITLE: Cathode for secondary lithium battery  
 INVENTOR(S): Noguchi, Takehiro; Yamazaki, Ikiko; Numata, Tatsuji  
 PATENT ASSIGNEE(S): NEC Corp., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 16 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005085720	A2	20050331	JP 2003-319552	20030911
PRIORITY APPLN. INFO.:			JP 2003-319552	20030911

L8 ANSWER 4 OF 10 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2004:451461 CAPLUS  
 DOCUMENT NUMBER: 141:9626  
 TITLE: Preparation of layered lithium chromium manganese  
 oxides as cathode material in lithium batteries  
 INVENTOR(S): Wu, Xianglan; Park, Yong Joon; Ryu, Kwang Sun; Chang,  
 Soon Ho; Hong, Young-Sik  
 PATENT ASSIGNEE(S): Electronics and Telecommunications Research Institute,  
 S. Korea  
 SOURCE: U.S. Pat. Appl. Publ., 7 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 2004105809	A1	20040603	US 2003-648614	20030825
US 6908708	B2	20050621		
KR 2004047252	A	20040605	KR 2002-75395	20021129
JP 2004186145	A2	20040702	JP 2003-383007	20031112
JP 3645561	B2	20050511		

PRIORITY APPLN. INFO.: KR 2002-75395 A 20021129  
REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 5 OF 10 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2004:20178 CAPLUS  
DOCUMENT NUMBER: 140:79796  
TITLE: Oxide cathode materials, their manufacture; and  
batteries using them  
INVENTOR(S): Li, Guo-Hua  
PATENT ASSIGNEE(S): Sony Corp., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 18 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004006293	A2	20040108	JP 2003-100758	20030403
US 2004234855	A1	20041125	US 2004-813542	20040330
TW 245443	B1	20051211	TW 2004-93109008	20040401
KR 2004086813	A	20041012	KR 2004-22854	20040402
CN 1571193	A	20050126	CN 2004-10071488	20040403
PRIORITY APPLN. INFO.:			JP 2002-102177	A 20020404
			JP 2003-100758	A 20030403

L8 ANSWER 6 OF 10 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2003:591490 CAPLUS  
DOCUMENT NUMBER: 139:152299  
TITLE: Positive plate active material and nonaqueous  
electrolyte secondary cell using same  
INVENTOR(S): Hosoya, Yosuke; Yamamoto, Yoshikatsu; Sato, Takashi  
PATENT ASSIGNEE(S): Sony Corporation, Japan  
SOURCE: PCT Int. Appl., 113 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 2  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003063275	A1	20030731	WO 2003-JP65	20030108
W: CN, KR, US				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR				
JP 2003203631	A2	20030718	JP 2002-1724	20020108
JP 2004134207	A2	20040430	JP 2002-296962	20021010
JP 2004139853	A2	20040513	JP 2002-303684	20021018
EP 1465271	A1	20041006	EP 2003-700481	20030108
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, CY, TR, BG, CZ, EE, HU, SK				
US 2004076882	A1	20040422	US 2003-468900	20030826
PRIORITY APPLN. INFO.:			JP 2002-1724	A 20020108
			JP 2002-296962	A 20021010

JP 2002-303684 A 20021018  
WO 2003-JP65 W 20030108  
REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 7 OF 10 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2003:550629 CAPLUS  
DOCUMENT NUMBER: 139:119901  
TITLE: Cathode active materials and nonaqueous electrolyte  
secondary batteries  
INVENTOR(S): Hosoya, Yosuke; Yamamoto, Yoshikatsu  
PATENT ASSIGNEE(S): Sony Corp., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 17 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 2  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2003203631	A2	20030718	JP 2002-1724	20020108
WO 2003063275	A1	20030731	WO 2003-JP65	20030108
W: CN, KR, US				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR				
CN 1515041	A	20040721	CN 2003-800053	20030108
EP 1465271	A1	20041006	EP 2003-700481	20030108
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, CY, TR, BG, CZ, EE, HU, SK				
US 2004076882	A1	20040422	US 2003-468900	20030826
PRIORITY APPLN. INFO.:			JP 2002-1724	A 20020108
			JP 2002-296962	A 20021010
			JP 2002-303684	A 20021018
			WO 2003-JP65	W 20030108

L8 ANSWER 8 OF 10 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2003:509089 CAPLUS  
DOCUMENT NUMBER: 139:232959  
TITLE: Lack of Cation Clustering in  $\text{Li}[\text{NixLi}_{1/3-2x/3}\text{Mn}_{2/3-x/3}\text{O}_2]$  ( $0 < x \leq 1/2$ ) and  $\text{Li}[\text{Cr}_x\text{Li}_{1-x/3}\text{Mn}_{2-2x/3}\text{O}_2]$  ( $0 < x < 1$ )  
AUTHOR(S): Lu, Zhonghua; Chen, Zhaohui; Dahn, J. R.  
CORPORATE SOURCE: Department of Physics and Atmospheric Sciences,  
Dalhousie University, Halifax, NS, B3H 3J5, Can.  
SOURCE: Chemistry of Materials (2003), 15(16), 3214-3220  
CODEN: CMATEX; ISSN: 0897-4756  
PUBLISHER: American Chemical Society  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
REFERENCE COUNT: 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 9 OF 10 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2001:324387 CAPLUS  
DOCUMENT NUMBER: 134:342495  
TITLE: compositions of granular lithium manganese oxides,  
their manufacture, and secondary batteries  
INVENTOR(S): Fukai, Kiyoshi; Yanagida, Kunio; Yano, Seiichi  
PATENT ASSIGNEE(S): Sakai Chemical Industry Co., Ltd., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 15 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent

LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2001122628	A2	20010508	JP 1999-305998	19991027
PRIORITY APPLN. INFO.:			JP 1999-305998	19991027

L8 ANSWER 10 OF 10 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2001:7553 CAPLUS  
DOCUMENT NUMBER: 134:74026  
TITLE: Layered lithium manganese oxide bronze and electrodes thereof  
INVENTOR(S): Dahn, Jeffrey R.; Paulsen, Jens M.  
PATENT ASSIGNEE(S): Chemetals Technology Corporation, USA  
SOURCE: U.S., 16 pp.  
CODEN: USXXAM  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 6168887	B1	20010102	US 1999-231636	19990115
PRIORITY APPLN. INFO.:			US 1999-231636	19990115
REFERENCE COUNT:	20	THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT		

FILE 'HOME' ENTERED AT 15:59:03 ON 13 DEC 2006

=> file reg

COST IN U.S. DOLLARS

SINCE FILE

TOTAL

ENTRY

SESSION

FULL ESTIMATED COST

0.21

0.21

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DICTIONARY FILE UPDATES: 12 DEC 2006 HIGHEST RN 915277-53-1

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<http://www.cas.org/ONLINE/UG/regprops.html>

=> s (1.01-1.59)/Li and (0.01-0.99)/Mn and (0.01-0.99)/Cr and (0.01-0.5)/Al and (1.81-2.49)/O

5795 (1.01-1.59)/LI

27138 (0.01-0.99)/MN

11986 (0.01-0.99)/CR

21154 (0.01-0.5)/AL

5906559 (1.81-2.49)/O

L1 6 (1.01-1.59)/LI AND (0.01-0.99)/MN AND (0.01-0.99)/CR AND (0.01-0.5)/AL AND (1.81-2.49)/O

=> file caplus

COST IN U.S. DOLLARS

SINCE FILE

TOTAL

ENTRY

SESSION

FULL ESTIMATED COST

25.56

25.77

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FILE COVERS 1907 - 13 Dec 2006 VOL 145 ISS 25  
FILE LAST UPDATED: 12 Dec 2006 (20061212/ED)

Effective October 17, 2005, revised CAS Information Use Policies apply.  
They are available for your review at:

<http://www.cas.org/infopolicy.html>

=> s l1 and battery  
2 L1  
129572 BATTERY  
L2 2 L1 AND BATTERY

=> d l2 1-2 ibib kwic

L2 ANSWER 1 OF 2 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2004:1128952 CAPLUS  
DOCUMENT NUMBER: 142:59801  
TITLE: Cathode material and secondary lithium battery  
INVENTOR(S): Li, Guo-Hua  
PATENT ASSIGNEE(S): Sony Corp., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 21 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004362934	A2	20041224	JP 2003-159808	20030604
PRIORITY APPLN. INFO.:			JP 2003-159808	20030604
TI	Cathode material and secondary lithium battery			
AB	The cathode material comprises a Li, Mn, Cr containing composite oxide and has a particle diameter at 90% on particle size distribution curve $\leq 10$ $\mu\text{m}$ and an average particle diameter 0.05-7 $\mu\text{m}$ . The battery has the above cathode, an anode, and an electrolyte solution			
ST	secondary battery cathode lithium manganese chromium oxide particle control			
IT	Battery cathodes (cathodes containing lithium manganese chromium composite oxides with controlled particle size for secondary lithium batteries)			
IT	410538-69-1, Chromium lithium manganese oxide ( $\text{Cr}_{0.4}\text{Li}_{1.2}\text{Mn}_{0.4}\text{O}_2$ ) 640772-76-5 640772-77-6 640772-78-7 RL: DEV (Device component use); PRP (Properties); USES (Uses) (cathodes containing lithium manganese chromium composite oxides with controlled particle size for secondary lithium batteries)			

L2 ANSWER 2 OF 2 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2004:20178 CAPLUS  
DOCUMENT NUMBER: 140:79796  
TITLE: Oxide cathode materials, their manufacture, and batteries using them  
INVENTOR(S): Li, Guo-Hua  
PATENT ASSIGNEE(S): Sony Corp., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 18 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2004006293	A2	20040108	JP 2003-100758	20030403
US 2004234855	A1	20041125	US 2004-813542	20040330
TW 245443	B1	20051211	TW 2004-93109008	20040401
KR 2004086813	A	20041012	KR 2004-22854	20040402
CN 1571193	A	20050126	CN 2004-10071488	20040403
PRIORITY APPLN. INFO.:			JP 2002-102177	A 20020404
			JP 2003-100758	A 20030403

ST battery cathode lithium manganese chromium oxide; titanium  
magnesium aluminum lithium oxide battery

IT Battery cathodes  
Secondary batteries  
(manufacture of Li-based mixed oxide cathode materials for batteries with  
good charge-discharge capacity and long cycle life)

IT 640772-79-8 640772-80-1  
RL: DEV (Device component use); USES (Uses)  
(manufacture of Li-based mixed oxide cathode materials for batteries with  
good charge-discharge capacity and long cycle life)

IT 640772-72-1P 640772-73-2P 640772-74-3P  
640772-75-4P 640772-76-5P 640772-77-6P 640772-78-7P  
RL: DEV (Device component use); IMF (Industrial manufacture); PREP  
(Preparation); USES (Uses)  
(manufacture of Li-based mixed oxide cathode materials for batteries with  
good charge-discharge capacity and long cycle life)

=> file reg

COST IN U.S. DOLLARS

SINCE FILE	TOTAL
ENTRY	SESSION
7.41	33.18

FULL ESTIMATED COST

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)

SINCE FILE	TOTAL
ENTRY	SESSION
-0.75	-0.75

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DICTIONARY FILE UPDATES: 12 DEC 2006 HIGHEST RN 915277-53-1

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conducting SmartSELECT searches.

REGISTRY includes numerically searchable data for experimental and  
predicted properties as well as tags indicating availability of  
experimental property data in the original document. For information  
on property searching in REGISTRY, refer to:

<http://www.cas.org/ONLINE/UG/regprops.html>

=> s (1.01-10)/Li and (0.01-5)/Mn and (0.01-5)/Cr and (0.01-5)/Al and (1.81-10)/O  
20952 (1.01-10)/LI  
479809 (0.01-5)/MN

423686 (0.01-5)/CR  
359470 (0.01-5)/AL  
20498958 (1.81-10)/O  
L3 12 (1.01-10)/LI AND (0.01-5)/MN AND (0.01-5)/CR AND (0.01-5)/AL  
AND (1.81-10)/O

=> file caplus

COST IN U.S. DOLLARS	SINCE FILE	TOTAL
	ENTRY	SESSION
FULL ESTIMATED COST	24.24	57.42
DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)	SINCE FILE	TOTAL
	ENTRY	SESSION
CA SUBSCRIBER PRICE	0.00	-0.75

FILE 'CAPLUS' ENTERED AT 16:03:24 ON 13 DEC 2006  
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FILE COVERS 1907 - 13 Dec 2006 VOL 145 ISS 25  
FILE LAST UPDATED: 12 Dec 2006 (20061212/ED)

Effective October 17, 2005, revised CAS Information Use Policies apply. They are available for your review at:

<http://www.cas.org/infopolicy.html>

=> s l3 and battery

5 L3  
129572 BATTERY  
L4 5 L3 AND BATTERY

=> d l5 1-5 ibib kwic

L5 NOT FOUND

The L-number entered has not been defined in this session, or it has been deleted. To see the L-numbers currently defined in this session, enter DISPLAY HISTORY at an arrow prompt (=>).

=> d l4 1-5 ibib kwic

L4 ANSWER 1 OF 5 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2004:1128952 CAPLUS  
DOCUMENT NUMBER: 142:59801  
TITLE: Cathode material and secondary lithium battery  
INVENTOR(S): Li, Guo-Hua  
PATENT ASSIGNEE(S): Sony Corp., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 21 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1

## PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004362934	A2	20041224	JP 2003-159808	20030604
PRIORITY APPLN. INFO.:			JP 2003-159808	20030604
TI	Cathode material and secondary lithium battery			
AB	The cathode material comprises a Li, Mn, Cr containing composite oxide and has a particle diameter at 90% on particle size distribution curve $\leq 10$ $\mu\text{m}$ and an average particle diameter 0.05-7 $\mu\text{m}$ . The battery has the above cathode, an anode, and an electrolyte solution			
ST	secondary battery cathode lithium manganese chromium oxide particle control			
IT	Battery cathodes (cathodes containing lithium manganese chromium composite oxides with controlled particle size for secondary lithium batteries)			
IT	410538-69-1, Chromium lithium manganese oxide ( $\text{Cr}_{0.4}\text{Li}_{1.2}\text{Mn}_{0.4}\text{O}_2$ ) 640772-76-5 640772-77-6 640772-78-7 RL: DEV (Device component use); PRP (Properties); USES (Uses) (cathodes containing lithium manganese chromium composite oxides with controlled particle size for secondary lithium batteries)			

L4 ANSWER 2 OF 5 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:20178 CAPLUS  
DOCUMENT NUMBER: 140:79796  
TITLE: Oxide cathode materials, their manufacture, and batteries using them  
INVENTOR(S): Li, Guo-Hua  
PATENT ASSIGNEE(S): Sony Corp., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 18 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004006293	A2	20040108	JP 2003-100758	20030403
US 2004234855	A1	20041125	US 2004-813542	20040330
TW 245443	B1	20051211	TW 2004-93109008	20040401
KR 2004086813	A	20041012	KR 2004-22854	20040402
CN 1571193	A	20050126	CN 2004-10071488	20040403
PRIORITY APPLN. INFO.:			JP 2002-102177	A 20020404
			JP 2003-100758	A 20030403
ST	battery cathode lithium manganese chromium oxide; titanium magnesium aluminum lithium oxide battery			
IT	Battery cathodes Secondary batteries (manufacture of Li-based mixed oxide cathode materials for batteries with good charge-discharge capacity and long cycle life)			
IT	640772-79-8 640772-80-1 RL: DEV (Device component use); USES (Uses) (manufacture of Li-based mixed oxide cathode materials for batteries with good charge-discharge capacity and long cycle life)			
IT	640772-72-1P 640772-73-2P 640772-74-3P 640772-75-4P 640772-76-5P 640772-77-6P 640772-78-7P RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses) (manufacture of Li-based mixed oxide cathode materials for batteries with good charge-discharge capacity and long cycle life)			

L4 ANSWER 3 OF 5 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:652874 CAPLUS  
 DOCUMENT NUMBER: 140:29477  
 TITLE: Cathode material for secondary lithium battery and its manufacture  
 INVENTOR(S): Liu, Xingquan; Yu, Zuolong; Li, Shuhua  
 PATENT ASSIGNEE(S): Chengdu Research Institute of Organic Chemistry, Chinese Academy of Sciences, Peop. Rep. China  
 SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 8 pp. CODEN: CNXXEV  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Chinese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1373528	A	20021009	CN 2001-107236	20010306
PRIORITY APPLN. INFO.:			CN 2001-107236	20010306
TI Cathode material for secondary lithium battery and its manufacture				
ST secondary battery cathodes manuf lithium manganese oxide				
IT Battery cathodes (manufacture of cathodes containing lithium manganese oxides for secondary lithium batteries)				
IT 632359-09-2P 632359-10-5P 632359-11-6P RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (manufacture of cathodes containing lithium manganese oxides for secondary lithium batteries)				

L4 ANSWER 4 OF 5 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:365395 CAPLUS  
 DOCUMENT NUMBER: 139:39079  
 TITLE: Synthesis and electrochemical performance studies of  $\text{LiMn}_{2-x-y-z}\text{Tl}_x\text{Al}_y\text{M}_z\text{O}_4$  ( $M = \text{Co}, \text{Cr}$  and  $\text{Ni}$ ) cathode materials for lithium-ion secondary batteries  
 AUTHOR(S): Liu, Xing-Quan; Zhong, Hui; Tang, Yi; Liu, Shu-Hua; Lin, Xiao-Jing; He, Ze-Zhen  
 CORPORATE SOURCE: College of Materials and Bio-engineering, Chengdu University of Technology, Chengdu, 610059, Peop. Rep. China  
 SOURCE: Wuji Huaxue Xuebao (2003), 19(5), 467-472  
 CODEN: WHUXEO; ISSN: 1001-4861  
 PUBLISHER: Wuji Huaxue Xuebao Bianjibu  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Chinese

AB  $\text{LiMn}_{2-x-y-z}\text{Tl}_x\text{Al}_y\text{M}_z\text{O}_4$  ( $M = \text{Co}, \text{Cr}$  and  $\text{Ni}$ ) cathode materials with spinel-type structures were synthesized by simultaneous co-doping Tl, Al and M during an improved solid state reaction. Their phys. and electrochem. performance as cathode materials at 25° and 55° were studied and measured. These materials have a spinel structure similar to the parent spinel  $\text{LiMn}_2\text{O}_4$  and they have uniform morphol. and a normal grain-size distribution. For  $M = \text{Co}$  and  $\text{Cr}$ , the mean grain size was 800 nm, and the initial charge capacity of  $\text{LiMn}_{1.90}\text{Tl}_{0.05}\text{M}_{0.03}\text{O}_4$  cathodes were 123.70 and 121.30 mA·h/g resp.  $\text{LiMn}_{1.90}\text{Tl}_{0.05}\text{Al}_{0.02}\text{M}_{0.03}\text{O}_4$  had capacities of 117.30 and 115.70 mA·h/g for  $M = \text{Co}$  and  $\text{Cr}$ . If  $M = \text{Ni}$ , the cathode material was unacceptable and the initial charge and discharge capacities were only 109.20 and 99.78 mA·h/g. The cathode material has 2 charge and discharge plateaus for charging and discharging when M is Co, Cr and/or Ni. The 2 plateaus tend to merge with an increase in Li content of the material. When M is Co and/or Cr, the cathodes have excellent performance at 25° and 55°, which can be attributed to a synergistic

interaction between the metals that increases the stability of the cathode material. Due to these properties the materials are candidates for battery cathodes of future elec. vehicles.

ST aluminum lithium manganese thallium oxide cathode battery

IT Battery cathodes

(synthesis and electrochem. performance of spinel-type lithium metal oxide cathodes for lithium-ion batteries)

IT 453538-28-8P 453538-28-8P, Aluminum chromium lithium manganese thallium oxide (Al<sub>0.02</sub>Cr<sub>0.03</sub>LiMn<sub>1.9</sub>Tl<sub>0.05</sub>O<sub>4</sub>) 544481-92-7P 544481-92-7P  
544481-94-9P 544481-94-9P 544481-95-0P 544481-96-1P 544481-97-2P  
544481-98-3P 544481-99-4P 544482-00-0P

RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)

(synthesis and electrochem. performance of spinel-type lithium metal oxide cathodes for lithium-ion batteries)

L4 ANSWER 5 OF 5 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:172050 CAPLUS

DOCUMENT NUMBER: 138:224144

TITLE: Secondary nonaqueous electrolyte battery

INVENTOR(S): Nakai, Kenji; Koishigawa, Yoshitada; Hironaka, Kensuke

PATENT ASSIGNEE(S): Shin-Kobe Electric Machinery Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 21 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2003068282	A2	20030307	JP 2001-372478	20011206
JP 3591506	B2	20041124		

PRIORITY APPLN. INFO.: JP 2001-180065 A 20010614

TI Secondary nonaqueous electrolyte battery

AB The battery has a coiled electrode-separator stack, containing a cathode having an active mass paste comprising a spinel crystal structured Li Mn composite oxide, a conductor and a binder on both sides of a collector, a Li-intercalating carbonaceous anode, and a separator between the electrodes in a battery case; where the coating amount of the oxide on each of the 2 sides of the collector is 80-120 g/m<sup>2</sup>, and the mass of the conductor and the binder is resp. 10-12 % and 3-5 % of the cathode active mass paste. The battery has high safety while having high capacity and power output.

ST secondary battery cathode active mass paste coating amt control;  
lithium manganese oxide cathode conductor binder amt control

IT Battery cathodes

(Li Mn oxide cathodes containing conductors and binders with controlled amount for secondary lithium batteries)

IT 7782-42-5, Graphite, uses 24937-79-9, PVDF 155472-68-7, Lithium manganese oxide (Li<sub>1.1</sub>Mn<sub>1.9</sub>O<sub>4</sub>) 156912-63-9, Lithium manganese oxide (Li<sub>1.03</sub>Mn<sub>1.97</sub>O<sub>4</sub>) 172922-65-5, Lithium manganese oxide (Li<sub>1.06</sub>Mn<sub>1.94</sub>O<sub>4</sub>) 176979-24-1, Lithium manganese oxide (Li<sub>1.12</sub>Mn<sub>1.88</sub>O<sub>4</sub>) 178404-38-1, Lithium manganese oxide (Li<sub>1.14</sub>Mn<sub>1.86</sub>O<sub>4</sub>) 500912-83-4, Aluminum lithium manganese oxide (Al<sub>0.2</sub>Li<sub>1.04</sub>Mn<sub>1.76</sub>O<sub>4</sub>) 500912-84-5, Lithium magnesium manganese oxide (Li<sub>1.04</sub>Mg<sub>0.2</sub>Mn<sub>1.76</sub>O<sub>4</sub>) 500912-85-6, Chromium lithium manganese oxide (Cr<sub>0.2</sub>Li<sub>1.01</sub>Mn<sub>1.79</sub>O<sub>4</sub>) 500912-86-7, Chromium lithium manganese oxide (Cr<sub>0.2</sub>Li<sub>1.04</sub>Mn<sub>1.76</sub>O<sub>4</sub>) 500912-87-8, Chromium lithium manganese oxide (Cr<sub>0.2</sub>Li<sub>1.1</sub>Mn<sub>1.7</sub>O<sub>4</sub>) 500912-88-9, Chromium lithium manganese oxide (Cr<sub>0.2</sub>Li<sub>1.11</sub>Mn<sub>1.69</sub>O<sub>4</sub>) 500912-89-0, Chromium lithium manganese oxide (Cr<sub>0.01</sub>Li<sub>1.04</sub>Mn<sub>1.95</sub>O<sub>4</sub>) 500912-90-3, Chromium lithium manganese oxide (Cr<sub>0.3</sub>Li<sub>1.04</sub>Mn<sub>1.66</sub>O<sub>4</sub>) 500912-91-4, Chromium lithium manganese oxide (Cr<sub>0.33</sub>Li<sub>1.04</sub>Mn<sub>1.63</sub>O<sub>4</sub>) 500912-92-5, Lithium manganese

nickel oxide (Li1.04Mn1.76Ni0.2O4) 500912-93-6 500912-94-7  
500912-95-8, Cobalt lithium magnesium manganese oxide  
((Co,Mg)0.2Li1.01Mn1.79O4)

RL: DEV (Device component use); USES (Uses)

(Li Mn oxide cathodes containing conductors and binders with controlled  
amount for secondary lithium batteries)

=> FIL STNGUIDE

COST IN U.S. DOLLARS

SINCE FILE

TOTAL

ENTRY

SESSION

FULL ESTIMATED COST

15.94

73.36

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)

SINCE FILE

TOTAL

ENTRY

SESSION

CA SUBSCRIBER PRICE

-2.25

-3.00

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AND TECHNOLOGY CORPORATION, AND FACHINFORMATIONSZENTRUM KARLSRUHE

FILE CONTAINS CURRENT INFORMATION.

LAST RELOADED: Dec 8, 2006 (20061208/UP).